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VOL. 3

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NEW JAVANESE SPECIES OF *HADRONOTUS* (HYM., PROCT. SCELIONINAE)

J.M.R.

By G. E. J. NIXON, B.A.

THE material with which the present short paper deals was submitted to the Imperial Institute of Entomology for determination by Dr. Leefmans, head of the Institute for Plant Diseases at Buitenzorg. It is at the request of Dr. Ferrière of the former Institute, himself too busy to undertake the task, that the writer describes the four new species which this material contains.

The specimens were all bred from the eggs of different species of Hemiptera by Mr. J. van der Vecht. The types have been placed in the British Museum.

The four species to be described have the following characters in common :—

Colour : The legs, except the coxae which are blackish-brown and the front femora which are more or less infuscated, uniformly yellow but varying in degree of brightness even in individuals of the same species; in any case, the colour of the scape, whether it be obscure or bright, will coincide pretty much with the colour of the legs. In the specific descriptions only the colour of the scape will be given as a rule.

Head clearly transverse, nowhere punctate. Frons with an impression which is margined or unmargined; in the latter case, it is defined at least, by being sculptured differently from the rest of the frons. Clypeus more or less semicircular, without a trace of lateral angles. Mandibles with 3 teeth, the upper one the longest. Eyes completely bare or with scattered, microscopic hairs which are visible only under a high magnification as in *homoeoceri*. Vertex behind, not at all margined; the occipital margin is continued upwards to as far as the temples at which point it turns abruptly inwards, describing an obtuse angle; the upper arm of this angle is very short. Posterior ocelli separated from the eye-margin by about their longer diameter. Cheeks without a trace of striation. Antennae of the male short, when folded back over the head, not extending beyond the posterior margin of the scutellum; segments 6–11 of the funicle not longer than wide.

Thorax covered with raised points or rugulosities, in no sense punctate. Postscutellum costate throughout; medially, its posterior margin is very slightly produced to form a transverse, ridge-like swelling which may be feebly emarginate. Seen from the side, the scutellum does not completely overlap the postscutellum except in individuals of *homoeoceri*. Wings uniformly yellowish- or brownish-hyaline, large, extending far beyond the apex of the abdomen; the pubescence is somewhat coarse, the hairs more or less erect and not very close together; the venation is pale and indistinct except in *leptocorisae*; the subcostalis is more or less straight, taking at the most a hardly perceptible downward curve before reaching the marginalis; marginalis about one-third as long as the stigmalis, except in *leptocorisae*; postmarginalis about twice as long as the stigmalis, its limits defined by the bristle-like hairs which arise from it.

Abdomen not obviously longer than wide.

It should be noted that such characters as those dealing with the pubescence of the wing and the arrangement and shape of its nervures in the above covering description are purely relative and have little independent value unless they are used in comparison with other species of the genus in which they are otherwise modified. The writer's paper on the African species of *Hadronotus*, now in course of preparation, will, it is hoped, show how far these and the other taxonomic details given can help in subdividing the members of the genus into fairly well-defined species-groups.

Key to the Species.

1. Frontal impression not margined by a ridge; radicle of the antennae a little more than one-third of the length of the scape . . . *leptocorisae*, sp. n.
   Frontal impression completely margined by a sharply defined ridge; radicle of the antennae distinctly less than one-third of the length of the scape . 2.
2. Vertex with a distinct, though sometimes ill-defined ridge connecting the posterior ocelli . . . . . 3.
   Vertex without a trace of a ridge connecting the posterior ocelli *dasyni*, sp. n.
3. Vertex in front of the posterior ocelli finely and fairly regularly reticulated, the meshes of the reticulation being about equal in size to the anterior ocellus *oophagus*, sp. n.
   Vertex in front of the posterior ocelli finely scabrous (the sculpture is extremely fine and quite indefinite) but with a few raised lines or reticulations forming a broken ring around the anterior ocellus . *homoeoceri*, sp. n.

Hadronotus dasyni, sp. n.

♀. Scape, pedicel and first 5 segments of the funicle rather intense ochreous yellow; the club has hence 5 black segments.

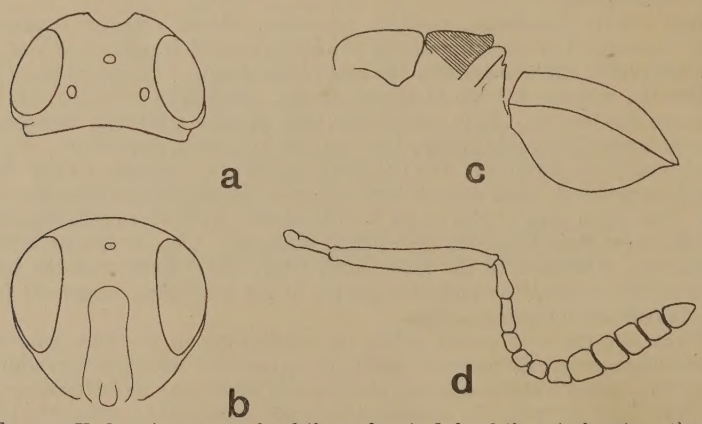

Fig. 1.—*H. dasyni*, sp. n.—*a*, head (from above); *b*, head (from in front); *c*, thorax (lateral); *d*, antenna, ♀.

Head not markedly transverse, its greatest width to its greatest length as 14 : 11. Frontal impression completely and sharply margined, rather narrow, about $2\frac{1}{2}$ times as long as its narrowest width, that is, just before the apex where it is very slightly narrowed; just at the point where the 2 lateral ridges bounding the impression bend inwards to meet above, a tiny ridge branches off from each almost at right angles and connects it with the inner margin of the eye; the impression is connected above with the anterior ocellus by a similar, more or less distinct ridge. Frons to the side of, and above, the impression, and the

anterior part of the vertex with strong, very distinct raised rugosities on a very finely scabrous surface which form a very irregular reticulation. Posterior, declivous part of the vertex strongly and more closely and evenly reticulated or sometimes transversely striate-reticulate. There is no trace of a carina between the posterior ocelli. The general impression of the sculpture of the head is that it is strong and coarse. Cheeks irregularly and strongly reticulated everywhere. Eyes large and close together, the shortest distance between them on the frons equal to their width. Antennae: radicle a little less than a third of the length of the scape; segment 1 of the funicle about twice as long as wide; 5 a little nearer in size to 6 than to 4 so that the club is more or less 6-segmented but is not sharply differentiated.

Thorax somewhat flattened. Mesonotum strongly and rather coarsely reticulate-rugose but the reticulate element by no means marked; posteriorly the rugosities tend to become longitudinal. The hairs are short, adpressed and each one tends to show more or less separately. Scutellum sculptured like the mesonotum, not at all gibbous posteriorly so that, when seen from the side, it is nearly in the same plane as the abdomen.

Abdomen a little narrower than the thorax, hardly longer than wide; segment 2 finely and sometimes very unevenly wrinkled over nearly its whole length; all the segments with broad, entirely smooth and shining apical bands.

The male differs from the female only in the antennae; these have the scape brownish-yellow and the funicle entirely blackish-brown.

Length: ♂♀, 1·4 mm. approx.

Java: Banka. Described from a series of 10 females and 2 males bred from eggs of *Dasynus piperis*, China.

The species is largely characterised by the strong, coarse sculpture of the head and of the thorax, by the large eyes and the shape of the head.

Hadronotus oophagus, sp. n.

In general appearance and size very like *dasyni*, but not as closely related to it as to the following species. It may be compared with *dasyni* as follows:—

♀. Scape, pedicel and first 4 segments of the funicle yellow; the club has hence 6 black segments, of which the first is not quite so dark as the following.

Head more transverse, nearly twice as wide as long, 28 : 15. Frontal impression wider, hardly twice as long as wide. Frons to the side of, and above, the impression, and the

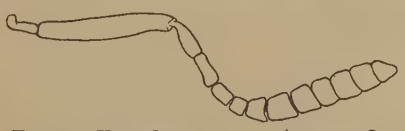

Fig. 2.—*H. oophagus*, sp. n. Antenna, ♀.

vertex in front of the posterior ocelli finely and fairly regularly reticulated, the meshes of the reticulation about equal in size to the anterior ocellus. No ridge connecting the frontal impression with the inner eye-margin. Posterior, declivous part of the vertex with well separated transverse wrinkles which are frequently interconnected by rugulosities. Posterior ocelli connected by a distinct and well-marked carina. Cheeks everywhere with rugose sculpture and with a distinct (at least below) ridge midway between the genal sulcus and the occipital margin and connecting the mandibles with the temples. Eyes less large than in *dasyni*, not so close together, the shortest distance between them on the frons rather more than $1\frac{1}{2}$ times their width, 8 : 5. Antennae: radicle $\frac{1}{4}$ the length of the scape; segment 1 of the funicle twice as long as its greatest width; 4 a little nearer in size to 5 than to 3 so that the club consists more or less of 7 segments but is not sharply differentiated.

Thorax not at all flattened, slightly compressed laterally between the mesonotum and the scutellum, quite strongly rugose, the sculpture consisting chiefly of irregularly shaped raised points and tiny wrinkle-like rugosities; the sculpture is more or less of the same type as in *dasyni*, but less coarse. Scutellum somewhat closely reticulate-rugose, seen from the side, raised quite strongly above the level of the abdomen; it is also slightly gibbous posteriorly but by no means overlaps the postscutellum.

Abdomen: Segment 2 with delicate, irregular wrinkles over nearly its entire surface; in the middle of the segment, the wrinkles tend to be more confluent and less distinct; following segments with the apical bands extremely finely granulate so that they appear less polished than in *dasyni*.

The male differs from the female only in the antennae; these are entirely ochreous-yellow, apically sometimes a little infuscated.

Java: Banka, 1931. Described from a series of 4 ♀♀ and 7 ♂♂ bred from the eggs of a Coreid bug.

Hadronotus homoeoceri, sp. n.

A species very close to *oophagus* and differing from it only as follows:—

♀. *Head*: The ground-sculpture of the frons and the vertex in front of the interocellar ridge is extremely finely scabrous, without an extensive sculpture of raised lines forming reticulations, except for those raised lines or incomplete reticulations which form a distinct but irregular ring around the anterior ocellus. There is a short lateral ridge joining the frontal impression with the eye-margin, as in *dasyni*. At first sight, the head above appears to be in greater part smooth but by no means polished. Eyes virtually bare, but under a high magnification showing scattered, extremely minute hairs.

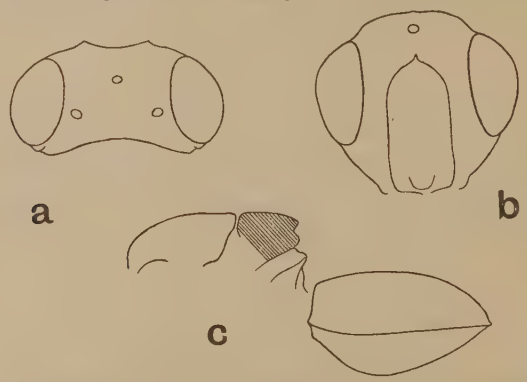

Fig. 3.—*H. homoeoceri*, sp. n.—*a*, head (from above); *b*, head (from in front); *c*, thorax (lateral).

Thorax: Scutellum a little more strongly and less closely reticulate-rugose than in *oophagus*, seen from the side, more raised above the level of the abdomen, more gibbous posteriorly and in the females sometimes completely overlapping the postscutellum.

♂. Antennae, except the scape, entirely obscure brownish.

Java: Buitenzorg. Described from a series of 3 ♀♀ and 2 ♂♂ bred from eggs of *Homoeocerus marginellus*, H. Sch.

This species and *oophagus* are clearly more closely related to each other than to *dasyni*. Both are characterised by the ridge connecting the posterior ocelli, by the laterally compressed thorax and by the gibbous scutellum. From each other they are most easily separated by the sculpture of the head.

It is very probable that *H. homoeoceri*, sp. n., is synonymous with *H. javensis*, Dodd. The 7-segmented antennal club of the female of *javensis* suggests an affinity with both *homoeoceri* and *oophagus*. The "almost bare" eyes of *javensis* point to an identity with *homoeoceri*, but Dodd's description is too inadequate to enable his species to be fixed with certainty.

Hadronotus leptocorisae, sp. n.

This insect stands apart from the three preceding species and is not to be confused with any of them.

♀. Scape of the antennae in greater part brownish, becoming yellowish on its basal third; first 4 segments of the funicle brownish; 4 paler beneath. Legs rather obscurely yellow, the front femora infuscated.

Head dull, large for the size of the insect and though clearly transverse, not conspicuously so, 22 : 15. Frons with a shallow impression which is nowhere distinctly margined and is traversed by fine wavy lines. Frons and the vertex between the ocelli very delicately and somewhat indistinctly reticulated; the meshes of the reticulations are, on the whole, considerably larger in size than the anterior ocellus. Posterior, declivous part of the vertex

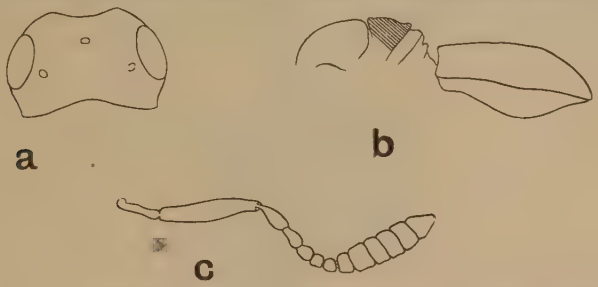

Fig. 4.—*H. leptocorisae*, sp. n.—*a*, head (from above); *b*, thorax (lateral); *c*, antenna, ♀.

in greater part without raised reticulations except towards the temples, dull, extremely finely granulated and appearing more or less smooth. No trace whatever of a carina between the posterior ocelli; the anterior and posterior parts of the vertex merge quite evenly and gently into one another. Cheeks behind the eyes dull and quite smooth but extremely finely granulated. Eyes rather small, the shortest distance between them on the frons, about twice as great as their width. Antennae : radicle distinctly more than one-third of the length of the scape; segment 4 of the funicle distinctly nearer in size to 3 than to 5 so that the apical 6 segments form a distinct and well-differentiated club.

Thorax a little narrower than the head, evenly convex, not at all compressed laterally between the mesonotum and the scutellum. Mesonotum very finely rugulose, the rugulosities consisting chiefly of minute, irregularly shaped points; it is clothed rather thickly with brownish hairs. Scutellum not at all gibbous posteriorly, in lateral aspect, nearly in the same plane as the abdomen. Fore-wings : subcostalis less distinct than the other veins; marginalis two-thirds as long as the stigmalis.

Abdomen : Segment 2 almost everywhere clearly and distinctly scaly-reticulate; this segment is larger in proportion to the rest of the abdomen than in the other species.

♂. Funicle brown. In all other respects, like the ♀.

Java : Lembang. Described from a series of 5 ♀♀ and 1 ♂, bred from eggs of *Leptocorisa acuta*, Thunb.

DESCRIPTIONS OF FIVE NEW SPECIES OF AGRIONIDAE FROM JAVA (ODONATA)

By M. A. Lieftinck.

(*Buitenzorg Museum.*)

Pseudagrion nigrofasciatum, sp. n. (figs. 1–2).

Material studied :—Two ♂♂, one ♀, labelled : Java orient., Hekm. (eijer), in Museum Leiden. Types in Mus. Leiden, paratype male in Mus. Buitenzorg. Allied to *P. bengalense*, Laidlaw.

Male (adult).—Labium ochreous. Head blue with a black point in front of median ocellus, and a broad transverse black fascia across the ocelli connecting the eyes; on either side, and behind, this band continues along the margin of compound eye, enclosing large, drop-shaped blue postocular spots which are confluent at occipital margin. Occiput blue.

Prothorax wholly black above, sides and a narrow line at margin of posterior lobe bluish-green; anterior lobe blue.

Synthorax blue, broadly banded with black, as is shown in fig. 1. Antehumeral stripes widest below and slightly constricted before their dorsal end. Sides conspicuously marked

Fig. 1.—*Pseudagrion nigrofasciatum*, sp. n. ♂. Java. Diagram of thoracic colour-pattern.

with black, the fascia along second lateral suture almost entirely covering the lower portion of metepisternum. Only the posterior third of latero-ventral suture striped with black. Venter pale greenish, coarsely whitish pruinose. Coxae of first and second pair of legs with some blackish spots exteriorly.

Legs greenish or rather ochreous. Exterior sides of all femora with a thick black line; tibiae and tarsi ochreous, the last tarsal joint blackish at tip. Spines dark brown, claws ferruginous.

Wings clear. Postnodal cross-veins $\frac{9.}{8.}\ \frac{10}{8}$ and $\frac{10.}{9.}\ \frac{11}{9}$. Pterostigma lozenge-shaped, reddish-brown.

Abdomen blue, marked with bronzed black, as follows :—segm. 1 with a large, squarish dorsal spot, almost touching the end of segment; 2 with a much larger, rectangular, marking on mid-dorsum, strongly constricted at both ends *but broadly attached in front as well as behind*. Dorsum of 3–6 with complete, longitudinal, black bands abruptly narrowed and simply pointed in front of each, just not touching posterior margin of preceding segment, the anterior mid-dorsal blue spots thus formed very narrow. Segm. 7 wholly black above. Segm. 8–9, except a narrow black line along posterior margin of each, entirely blue ; 10 black dorsally, blue along sides.

Anal appendages rather long, the superiors only a trace shorter than tenth abdominal segment, black above and aside, blue interiorly. Superior appendages widely distant, their lower branch without basal teeth but with a rounded dilatation before the middle of each that is also conspicuous when looked at in profile; in side view the apices appear strongly cleft. Inferior appendages with an acutely pointed median tooth, well visible in lateral view (fig. 2).

Female (adult).—Labrum and anteclypeus dirty ochreous. Postclypeus and frons yellowish-brown, the former with a few dark brown dots in the centre. Dorsal surface of head dark cinnamon-brown, with a triangular black spot in front of each lateral ocellus and a similar crescentic spot along the mesal margin of each. Postocular spots indistinct, greenish-brown, diffusely margined with black anteriorly and each with a slightly arched, black stripe behind. Occiput pale ochreous.

Prothorax light brown, above with a well-pronounced black M-shaped marking, the feet of which being outwardly bent, terminating at the side-margin. Posterior lobe unmarked, slightly projecting and well rounded posteriorly; prothoracic horns obsolete, reduced to mere tubercles along margin, not forwardly bent and provided with a few long bristles.

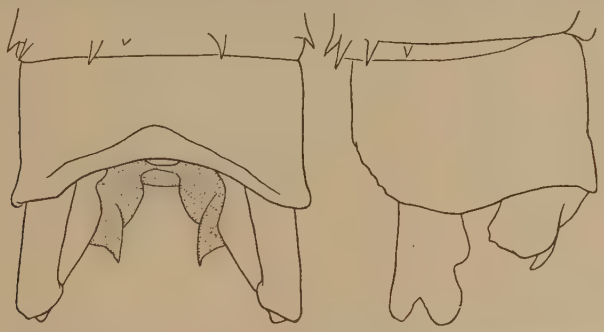

Fig. 2.—*Pseudagrion nigrofasciatum*, sp. n. ♂. Java. Anal appendages, dorsal view and right side.

Synthorax brown, without bluish or greenish intermingling. Mesepisterna dark ferruginous brown, each with a narrow black stripe running parallel and close to the median carina, which is also black; the black juxtamedian line slightly widened below and not extending as far up as the antealar ridge. A fine black line along humeral suture, slightly swollen near upper end and somewhat widened (rather golfstick-shaped) along infraepisternal suture. Mesepimera yellowish-brown, metepisterna dark brown instead of black, and metepimera again a little paler in colour. A black point at first lateral suture between stigma and dorsal margin of thorax, and a small, crescent-shaped black impression at upper end of second lateral suture. Sides of prothorax, infraepisterna, and venter of synthorax coarsely pruinose-white.

Wings hyaline. Postnodal cross-veins $\frac{10}{9}$. Pterostigma pale ochreous.

Ground-colour of abdomen dull yellowish-brown. First segment marked with black as in the male. Segm. 2 with a complete vase-shaped marking from end to end, widened behind the middle; segm. 3–9 with complete black markings almost touching anterior margin of segments, the pale ground-colour being visible above as narrow brownish rings. Segm. 10 unmarked, its hinder margin almost entirely divided in two portions by a deep Λ-shaped incision.

Anal appendages vestigial. Valves short.

Length: ♂ abd. + app. 30, hind-wing 19; ♀ 29·5, 20·5 mm.

Differs from *P. microcephalum* and *bengalense* by the broad black pleural fascia on synthorax, by the conspicuous black marking, touching anterior margin, upon the back of second abdominal segment, by the long and deeply excised superior anal appendage, and by the acutely pointed inferior appendage.

The female is at once distinguished from *bengalense* in having no median black stripe on the back of synthorax.

P. nigrofasciatum is the fourth representative of the genus in Java.

Teinobasis euglena, sp. n. (fig. 3).

1898. Krüger, Stettin. ent. Ztg., **59** : 120–121.—♀ Soekaranda, Sum. (*Telebasis combusta*).

Material examined :—South Sumatra. Three ♂♂, one ♀ (taken *in cop.*), Lampong Bay, Telok Betoeng (Oosthaven), coastal swamp, 3.vi.1929 (*F. C. Drescher*).—Mid Java. Two ♂♂, nine ♀♀, South Banjoemas, Segara Anakan territ. (Kinderzee), near Patimoean, 8.iv and 8.vii.1930; one ♂, Tjilatjap, 10.xii.1930, "at lamp"; eighty-one ♂♂, twenty-one ♀♀, Djeroeklegi, 16.i, 7 and 28.ii, 1 and 7.iii, 11 and 14.iv, 1931 (*F. C. Drescher*).

Holotype male and allotype female: Djeroeklegi, 7.ii.1931, in Mus. Buitenzorg.

Male (adult, Djeroeklegi).—Labium pale ochreous; genae vivid bluish-green. Mandibles reddish-brown. Labrum and clypeus very shining, glossy black, the former narrowly bordered with reddish-brown. Frons and vertex black, unmarked, except a short ochreous yellow stripe between each of the lateral ocelli and the base of antennae. These dark brown, the first two joints ochreous. Dorsal surface of head otherwise bronzed black, the entire space limited anteriorly by the epicranial suture and posteriorly to slightly before the occipital margin being different in colour, enclosing very large and conspicuous brilliant metallic blue "postocular spots," the vertex being also metallic blue or green at middle. Occipital ridge diffusely brownish. Occiput jet-black.

Prothorax black, coarsely powdered with blue along sides, and with a yellow margin. Anterior and posterior lobes reddish-brown, darker in the centre. Posterior lobe well pronounced, depressed, its margin evenly rounded.

Synthorax entirely black, without any pale markings, except a vestige of a yellow line along latero-ventral margin, and a similar stripe along bases of coxae. Mesepisterna, to a level slightly before and parallel to the humeral suture, throughout brilliant metallic green, forming a large median band. Mesepimera and the interior shoulder-stripe jet-black. Metapleurae and the black ventral surfaces of thorax coarsely bluish-pruinose, sutures of the latter pale yellowish.

Legs bicolorous. Coxae, trochanters and femora jet-black, with rather broad ochreous rings at articulations, and fine, slightly diffuse, yellowish rings near the base and at apices of all femora. Outer surfaces of all tibiae and tarsi vivid ochreous brown, slightly darker interiorly. Spines and tarsal claws similar in colour, the latter without an inferior tooth.

Wings hyaline, tinged with yellowish all over the membrane. Neuration brown. Petiolation terminates at level of *Ac* at which point the wings are at first gradually and rather strongly widened, with their lower margin almost straight; this widening, however, continues to a level decidedly more distad than is usually the case in *Teinobasis*: in both wings the greatest width is reached at a level about mid-way between the origin of the nervures M_2 and M_{1a}; from thence they taper rapidly, the tips being decidedly more broadly rounded than in any other species of the genus. *Ac* lies much nearer the level of Ax_2 than of Ax_1. *Ms* originates at the subnodus in both wings, while the position of M_3 is variable; in front wing it arises either almost from the same point as *Ms*, at subnodus,

its stem then being almost straight (type specimen), or its base is distinctly removed proximad and well curved; in hind-wing the origin of M_3 varies from a little before subnodus (type specimen) to distinctly proximal to it.

A_1 arises well distal to Ac, the distance being longer than Ac itself. In front wing about the distal third of the vein M_4 and the distal half of Cu_2 are broken, in hind-wing the straight course of these veins is a little longer. Pterostigma short and high, almost square, covering exactly one underlying cell; dark brown or black, surrounded by a fine whitish line and heavily framed in black. Costal side in both wings shorter than anal side, and hence distal side less oblique than proximal side (in fact the outer edges of the pterostigma are almost straight). Postnodal index $\frac{11-13}{11-12}$, in most specimens, including the type, $\frac{12}{11}$.

Abdomen long and very slender, all segments dark bronzed green on dorsum, the metallic green shine especially vivid on segm. 1–2 and base of 3. The dark markings on dorsum of first two segments ill-defined laterally, fading to brownish at margin, the sides largely pale ochreous. Segm. 3–8 have very small, though sharply pronounced, paired, clear yellow lunules at the bases of each, the sides of these segments being dull ochreous in colour. Moreover, the dorsal bands are a little widened at the apex of each segment, expanding somewhat over the sides, and on segm. 8 the entire distal half of the segment is darkened aside. Tergites of 9 and 10 wholly black, with the articulations and the posterior margin of segm. 10 ochreous. Sternites of segm. 3–9 black.

Tenth segment with a sharp, crescent-shaped, subapical, median ridge; the triangular space posterior to it much sloping to behind and depressed. Seen from behind the posterior margin of this segment is produced in the middle to form a large, parallel-sided offshoot, directed vertically downwards and projecting far beyond the insertion of superior anal appendages; apically this offshoot is deeply excavated, forming on either side a finger-shaped branch (fig. 3).

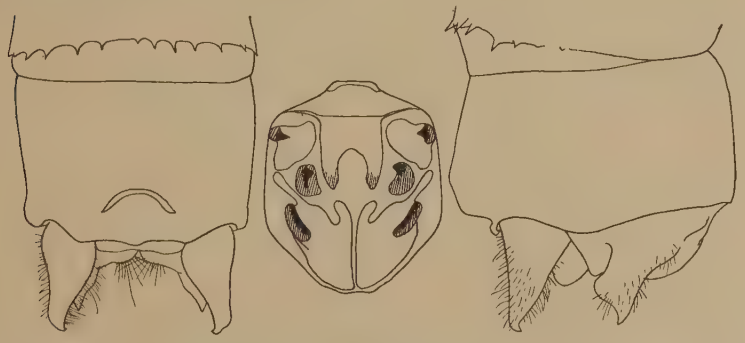

FIG. 3.—*Teinobasis euglena*, sp. n. ♂. Sumatra. Anal appendages, dorsal view, hinder aspect, and right lateral view.

Anal appendages vestigial. The superiors are brown in colour, widely distant, thick at base, almost cylindrical, tapering rapidly towards apices, which, in dorsal view, are a little curved inwards and downwards. Lower interior branch much shorter, blackish in colour, rather hook-like but evenly rounded in profile view. Inferior appendages yellowish-brown, almost equal in length to upper pair, much swollen at base, divided into three branches, the outer being longest and much pointed; the remaining branches are much shorter, upwardly curved, partly enclosing the interior branch of superiors, and pressed closely against the vertical wall of the last segment. For details of structure see fig. 3.

Male (juv., Djeroeklegi).—Entirely different in colouring from the adult male, as follows :—

Genae, mandible-bases and anterior border of labrum yellow; a short stripe along the margin of compound eye, the anteclypeus, and a transverse stripe behind postclypeus on frons pinkish or orangish in colour, the remainder of face dark reddish-black, very shining. Frons black. Dorsal surface of head entirely brilliant metallic blue with green and purple reflexes, save for a short yellow stripe between each of the lateral ocelli and the base of antennae, as in the adult male. Occiput jet-black.

Prothorax carmine, unmarked.

Synthorax carmine, with a longitudinal, median band of brilliant metallic blue, similar in form to that of the adult male. Anterior median triangle and posterior antealar ridges unmarked. Thoracic sides unmarked, save for a minute black point in top of humeral and second lateral sutures, placed immediately below the wing-bases. Venter of thorax pale yellow.

Legs pale in colour, unmarked; coxae yellow, femora pale carmine, tibiae and tarsi yellow. Spines dark brown.

Wings hyaline. Pterostigma whitish, dark greyish in the centre.

Colour-design of abdomen similar to the mature male, with the following differences :— on segm. 1–3 the dorsal black bands are of a fine metallic blue colour, and the sides of 1–2 are pale carmine. Intermediate segments not different, but the segm. 9 and 10 and the anal appendages are unicolorous vividly carmine.

Female (adult, Djeroeklegi).—Differs from the male in the following respects :—

Labrum bright ochreous, bordered with black aside, and with a conspicuous black basal point in the middle. Clypeus dark brown. Frons in front dirty greenish. Head bronzed black above, " postocular spots " with only slight metallic green lustre.

Prothorax reddish-brown, with indistinct dark spots on dorsum of middle lobe. Posterior lobe entire, evenly rounded behind but with hinder margin thickened in the middle, forming on each side of the median line a very low, rather shining, tubercular swelling (this evidently points to a relationship with *Pseudagrion* !).

Synthorax with longitudinal, mid-dorsal metallic green band, similar in form to the male, but not nearly so brilliantly shining. On either side of this fascia there is a reddish-brown humeral band extending downwards to a little over the humeral suture, where it gradually passes into ferruginous and finally into grass-green. Sides thus green, paler beneath, with the sutures ochreous or whitish. Venter pale greenish-yellow, as are also the coxae and trochanters. Legs otherwise unicolorous dirty yellow, with spines and apex of last tarsal joint dark brown.

Wing-membrane slightly washed with yellowish. Pterostigma yellow, pale brown in the centre. Nodal index $\frac{12-14}{12-14}$.

Abdomen with dorsal markings similar to the male but with bronzed green bands less shining. Sides dirty ochreous, intermingled with green on proximal segments. Dorso-lateral pale lunules distinct, present on all segments except on 8–9 that remain largely reddish, with dorsal black bands indistinct. Segm. 10 and anal appendages reddish. Distal margin of 10 with a V-shaped incision at middle. There is, besides, a very curious process originating from the hinder surface of this segment, and projecting straight backwards from the middle of it, just below the apical margin, between the anal appendages. This process is only small, reaching half the length of appendages, trapezoidal in shape, shining black in colour, and is strongly concave above, the apex being abruptly truncated. In side view it is well visible, lying just dorsal to the anal appendages which are short, simple, and conical.

Valves rather long, pale yellow, reaching slightly beyond the tips of appendages; their lower margin but little convex.

Female (juv.).—Almost exactly similar to the juvenile male.

Upper surface of head and median longitudinal thoracic band brilliant metallic green instead of blue. Face entirely red with a black basal point on the middle of labrum, and with the lateral basal edges of the same also black. Frons in front pale reddish, irregularly limited behind.

Terminal segments of abdomen largely red, segm. 9 with median dark fascia narrow and ill-defined.

Length: ♂ abd. + app. 31·5–35, hind-wing 18·5–20; ♀ 33–34, 21–22 mm.

This is the fourth species of *Teinobasis* known to inhabit the Malaysian subregion. The remainder are :—

T. bicolor, Martin.—Banguey Is. (1897, *Ann. Soc. ent. Fr.*, **66** : 593–596, ♂).

T. kirbyi, Laidlaw.—Malaya; Borneo ? (*Proc. Zool. Soc.*, **1902** : 386–387, ♂).

T. ruficollis, Selys.—Singapore; Sumatra, Riouw Arch., Borneo (1877, Synops. Agrion., pp. 25–26, ♂).

T. gracillima, Fraser, erroneously reported from Java, almost certainly comes from Celebes (1926, *Treubia*, **8** : 494, fig. 7, ♂).

T. combusta, Selys, originally described from Soeloe Is. (1877, Synops. Agrion., pp. 26–27, ♀),* and recorded by Krüger (*loc. cit.*) from Sumatra, is doubtless not de Selys's species and may turn out to be identical with *euglena*, m.

The three Malaysian species are distinguished from *euglena* in the following points :—

T. bicolor.—Length of abdomen 38 mm. Postnodal cross-veins 12. Inner half of pterostigma of front wing black, the outer half yellow. Superior appendages thickened at apex, and much longer than inferior pair.

T. kirbyi.—Large species. Abdomen and appendages unknown. Hind-wing 25 mm. Median and subnodal sectors united by a common stalk from their origin as far as the first transverse nerve they encounter (Laidlaw, *loc. cit.*).

T. ruficollis.—This well-known species is easily recognised by its curious semicircular upper anal appendages. I have seen specimens from Doerian Is. in the Riouw Archipelago, and from W. Borneo, now in the Buitenzorg Museum collection.

Ceriagrion annulosum, sp. n. (fig. 4).

Material studied :—One ♂, adult, labelled : Java Fr. [uhstorfer] 61 (square yellow pin-label), *Pseudagrion annulosum*, Selys, n.sp. Java (written drawer-label), both in de Selys' handwriting.—Holotype in Brussels Museum.

Possibly allied to *coeruleum*, Laidlaw, from North India.

Male (colours somewhat faded).—Labium pale yellow, tipped with blackish. Labrum bright chrome-yellow, anteclypeus clear bluish-green, anterior surface of head otherwise dull grass-green. Frontal ridge sharply pronounced. Antennae greenish-yellow (partly broken off). Vertex and epicranium brownish-olive, growing darker behind, the postocular area being dull orange or cinnamon-coloured. Occiput dirty yellowish.

Pro- and syn-thorax olive-green (in living examples very likely grass-green in colour). A fine brownish line at base of posterior lobe of prothorax, a similar, ill-defined, line along mid-dorsal carina, and a narrow, badly delimited, brownish stripe along humeral suture. Coloration of the sides of synthorax gradually growing paler from above down, more yellowish-green, the ventral surface and coxae being rather more ochreous in colour.

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* The Sulu (= Soeloe) Archipelago, situated between Borneo and Mindanao, was not visited by Wallace. All insects labelled " Sulu, Wallace," were taken by Wallace's assistant collector Mr. Allen on Soela Mangole, the eastern island of the Soela Archipelago.

Legs pale ochreous, with a distinct, though narrow, dark brown line along outer sides of all femora, and with the spines and tarsal claws black.

Wings evenly tinged with saffron. The nervure *Ab* arises from *Ac* in all four wings. Postnodal index $\frac{14}{13}\ \frac{15}{13}$. Pterostigma very small, of equal length but smaller than one underlying cell, diamond-shaped with outer angle acute and costal side about one and half times longer than proximal side; dark brown with a narrow yellow line along costal margin.

Abdomen long. Ground-colour a rich chrome yellow, with slight greenish intermingling especially vivid on dorsum and sides of segm. 2. Terminal segments rather darkened.

Fig. 4.— *Ceriagrion annulosum*, sp. n. ♂. Java. Anal appendages, dorsal view and right side.

Dorsum of first segment with a squarish dark brown spot at base. Segm. 2 with two minute apical spots of the same colour on each side of the median line, and with the articulation dark brown. Segm. 3–6 with very distinct blackish-brown apical rings, occupying about one-sixth of the length of each segment; on 3 this ring is slightly indented on middorsum by the median yellow ground-colour; on 4 and 5 the spots are broadly attached to the black streak at articulation, and their anterior limit is slightly concave. Ground-colour of segm. 7–10 and distal half of 6 darkened; black apical rings on 6 and 7 incomplete and divided into two by the median line, rather comma-shaped when seen from aside. Segm. 8 with similar, black, comma-shaped spots on either side behind the middle of segment, 9 entirely black, except a pale apical ring; 10 black with the under surface greenish in colour. Posterior margin of segm. 10 with a triangular incision above.

Anal appendages darkened, much shorter than tenth segment of abdomen, shaped as appears from fig. 4. (Hairs rubbed off and not shown in the figure.)

Length: abd. + app. 38, hind-wing 25 mm.

Female unknown.

A very distinct species, differing from all its congeners by the curious dark apical rings round about segments 3–6 of abdomen.

C. annulosum is one of the largest species known, and is the fifth representative of its genus reported from the island, including *C. cerinorubellum* (Brauer).

Mortonagrion falcatum, sp. n. (fig. 5).

Material examined:—Ten ♂♂, six ♀♀ (one pair taken *in cop.*), Karimoen Djawa Islands (Java Sea), P. Karimoendjawa, Mangrove-swamps near the debouchment of the small brooks Pakbahar, Todjero, Pantjoeran and Lèlè, at about sea-level, 25, 26, 27, 28, and 29.xi.1930 (*M. A. Lieftinck*).

Living colours (male):—Head in front and sides of thorax vivid green. Eyes above dark brownish-olive, below olive-green. Labrum, postocular spots and antehumeral thoracic stripes purple. Segm. 1–3 of abdomen partly greenish-purple, segm. 8 partly sky-blue above. Female similar to male but with the face darker and the blue marking on segm. 8 of abdomen smaller.

Male (adult, colours somewhat faded).- Labium pale yellowish. Anterior surface of head grass-green, with slight purplish intermingling on the labrum only. Frons and epicranium warm dark reddish-brown. Coloration of the anterior half of vertex, between postocular spots and epicranial suture, slightly paler, rather chestnut-brown. The posterior half of the vertex is occupied on either side by subtriangular, bluish-purple spots of moderate size, which are pointed mesad and do not meet one another in the median line; at the middle of their anterior border each of these spots has a shallowly triangular incision. Occipital margin reddish-brown, fading to pale greenish-yellow underneath. First two joints of antennae reddish-brown, the remainder darkened.

Prothorax warm reddish-brown above, vivid green aside; anterior lobe with a large blue patch on the middle. Posterior lobe projecting somewhat to behind, but little elevated in the middle, and with evenly rounded margin.

Fig. 5.—*Mortonagrion falcatum*, sp. n. ♂. Karimoendjawa. Anal appendages, dorsal view and right side.

Dorsum of synthorax, as far down as the first lateral suture, dark cinnamon- to hazel-brown, with complete, straight, narrow, dark purplish-blue antehumeral stripes, touching humeral suture at extreme dorsal end only. Sides entirely bluish-green with a diffuse, brownish spot at upper end of second lateral suture. Venter whitish, powdered with white.

Coxae greenish. Legs otherwise pale ferruginous, the femora often a little darkened towards apices. Spines dark brown; tarsal claws reddish, tipped with black, and with a distinct, though small, inferior apical tooth.

Wing-membrane tinged with brownish-yellow all over. Pterostigma pale cinnamon-coloured, elongately lozenge-shaped, costal side less than one and a half times longer than proximal or distal sides; these rather oblique, sub-parallel, and a little outwardly bent at their middle. Postnodal index $\frac{8-10}{7\ 8}$.

First two segments of abdomen blue (greenish aside), with dark reddish-brown markings, as follows: squarish brown spot on dorsum of first segment and a large, rather U-shaped marking on dorsum of second segment; the branches of the U lie on the sides and do not touch the anterior margin, whilst, posteriorly, this figure is broadly attached to the hinder margin of the segment. Sometimes there is, besides, a complete, mid-dorsal, longitudinal brownish line, dividing the blue area between the branches of the U into two equal parts. The segments 3–6 are hazel-brown, becoming progressively darker, but have each a sharply

pronounced, though small, clear blue ring at their extreme base. On segm. 3 this ring is well visible, but on 6 is scarcely perceptible. Segm. 7 very dark brown, almost black, unmarked. Basal half or a little more of 8 clear blue, finely indented by black mid-dorsally, the lower third of the sides being likewise black; remainder of segment black in colour, as are also the segments 9 and 10. Sternites of segm. 8–10 bluish-green. Tenth segment less than half as long as segm. 9, its posterior margin not elevated and almost straight.

Anal appendages very small, black. Upper pair in dorsal view a trace shorter than segm. 10, divaricate and conical in outline; in side view each appendage is obliquely and almost circularly bowed forwards and rather inwards, the tips being well pointed. Inferior appendages about half the length of superiors; inner branch thick and broad, the upper margin of each forming a rounded tubercle, between which the tips of the superiors are intercalated; outer branch much longer than inner, directed almost straight backwards with the apex acutely pointed and provided with a small, dorsal, subapical tooth (fig. 5).

Female.—Head similar to the male. Labrum pale brownish-ochreous. Clypeus darker, similar in colouring to the dorsal surface of head, viz. dark purplish-brown. Post-ocular spots as in the male, but slightly shorter and placed a little more laterad. Eyes dark olive-brown above.

Prothorax hazel-brown, with the sides and the anterior lobe bluish-purple. Posterior lobe less pronounced than in the opposite sex, depressed, its hinder margin brace-shaped, the median triangular projection of it being depressed and fitting close against the median triangular mesepisternal plate.

Synthorax as in the male. Antehumeral lines perhaps a little wider, purplish-blue in colour, as is also the lamina mesostigmalis. Thoracic sides bluish-green to grass-green, with very diffuse shades along upper margin of second lateral suture.

Legs dirty ochreous or pale brown, with distal half of exterior sides of femora diffusely mottled with black. Last tarsal joint tipped with black.

Wings tinged with yellow throughout. Pterostigma pale ochreous. Nodal index $\frac{9-10}{8}$.

Abdomen almost exactly similar in colouring to the male, pale markings bluish-purple above, green aside. The blue spots on segm. 2 are reduced to a single, large, cuneiform, longitudinal spot on either side along basal half of the segment, and a lateral spot along apical margin. Paired, crescent-shaped, blue spots at the bases of segm. 3–6 similar in size but not reaching lower margin of tergites. In four specimens a vestige of such a spot is also traceable at base of segm. 7. Segm. 8–10 very dark brown, unmarked, except in most cases a blue dorsal spot at base of segm. 8, decidedly smaller and more rounded behind than in the male.

Anal appendages dark reddish-brown, slightly shorter than segm. 10, conical, tapering gradually to behind, the apices being rounded. Tuberculum anale equal in length to the appendages. Valves short, reaching half the length of anal tubercle, their lower margin slightly convex.

Length: ♂ abd. + app. 21·5–23, hind-wing 13–13·5; ♀ 21–23·5, 13–15 mm.

As appears from the accompanying description and figures, this is a very distinct species, allied I think most closely to *M. simile*, Ris, from Sumatra and Borneo, but easily recognised by the dark purple colouring on head and thorax, the pale legs, the vivid blue marking on dorsum of eighth abdominal segment, and by the curious shape of male anal appendages.

To the four species of *Mortonagrion* hitherto known, *Indagrion gautama*, Fraser, from Assam, should possibly be added. Of these only two were known to occur in the Malay Archipelago, namely *simile*, Ris, from Boeloe Tjina and Medan in N.E. Sumatra, and *amoenum*, Ris, from Simaloer Is. off the West

coast of Sumatra. Of the former I have received a good male specimen, taken by Mr. Coomans de Ruiter, near Singkawang, West Borneo, and of *amoenum* Mr. Drescher took a single specimen near Telok Betong, in South Sumatra (coastal swamp, 3.vi.1929), so that this is also a Sumatran species.

It is of considerable interest to learn that all three Malaysian species were taken near the coast, and possibly are restricted to the coastal swamps situated just behind the true mangrove woods. In Karimoen Djawa, at least, *falcatum* was found only in the most inaccessible places of this zone, where *Pandanus* and spiny creepers intermix with sedge-hassocks of a man's height, between which numerous very deep and muddy sloughs are scattered all over the region. Apparently these sloughs contain brackish water, and I failed to discover any aquatic plants in them. Many were entirely concealed by overhanging shrubs and grasses so that they were very difficult to approach.

The *Mortonagrion* were only found among these pools, seated on trash or resting on twigs close to the water's surface. They were very indolent, and, when startled, flew only short distances away; but owing to their cryptic colouring and their hiding among the tangle of roots and twigs were hard to detect, and could only be taken at random. It was quite impossible to look for the larva, but I am inclined to think they are to be found among the fine roots of sedges and other plants fringing the border of these pools. The species was decidedly Ischnuran in its manner of flight and resting attitude, and there are several reasons other than those just mentioned to expect a type of larva similar to that of *Ischnura*.

Other Odonata taken in this locality were *Archibasis melanocyana*, Selys (found also in Java !), *Agrionoptera insignis*, Ramb., *Orthetrum chrysis*, Selys, and *Raphismia bispina*, Hagen. Of these, *A. insignis* and *R. bispina* are very rare in Java and occur only near the sea coast, the latter being essentially restricted to the mangrove forests.

It is hoped to publish a detailed account of the fresh and brackish water insects of the Karimoen Djawa Islands elsewhere.

Aciagrion fasciculare, sp. n. (figs. 6–7).

Material examined :—Fourteen ♂♂, W. Java, South Preanger, Djampangs, *ca.* 800 m. alt., near Soekanegara, 23–24.xii.1931 (*M. A. Lieftinck*). Ten ♂♂ from the same locality, 27.iii. and 15.vi.1932 (*Dr. L. J. Toxopeus*). Holotype (24.xii.1931) in the Buitenzorg Museum collection.

Related to *A. aciculare*, Lieft., but smaller and more compactly built, dark colours more extensive and light markings dark purple instead of vivid blue.

Male (adult).—Labium whitish. Labrum ochreous green with an ill-defined black stripe at base. Genae, anteclypeus and frons, to a level about mid-way between clypeal suture and median ocellus, dark purplish, as is also the swollen base of the antennae. Postclypeus and antennae black. Vertex wholly dark bronzed green. Postocular spots dark purplish, much narrower and more backwardly placed than in *aciculare*, widest laterally, and united across the occiput by a narrow stripe of the same colour, their outer border rounded and not touching the eye-margin; in several examples these spots are only little wider than their connecting-line, almost linear. Upper half of occiput bronzed green, lower surface of head pale greenish-yellow, coarsely pruinose.

Prothorax black above; the entire anterior lobe, a minute spot on lateral edges of posterior lobe, and the sides purple in colour. Posterior lobe evenly rounded, slightly thickened along margin. Sides in fully mature specimens coarsely bluish-pruinose.

Dorsum of synthorax black to a level about mid-way between humeral and first lateral suture, with a narrow pair of straight, purple, antehumeral stripes. These lines are equal in width to the black space between each of them and the humeral suture. Laterally, the black colour occupies the upper two-thirds of the mesinfraepisternum. Sides vivid purple, with a minute dark spot at upper end of second lateral suture. In mature specimens the thoracic sides are densely powdered with greyish-blue, giving these parts a soft, livid purple colour.

Coxae and trochanters pale, likewise pruinose. Femora light purplish with a sharply delimited, thick black stripe upon exterior surfaces, this stripe growing wider from base to apex, the knees being largely black. Spines very short, black, 2–3 on anterior, 5 on middle, and 6–7 on posterior femora. Tibiae and tarsi yellow; exterior third of first pair of tibiae with a black line, spines and apex of last tarsal joint black. Claws yellow, tipped with black, with distinct, subapical, interior tooth.

Wings very narrow, hyaline, iridescent. Postnodal index $\frac{9-12}{8-9}$, in eleven examples there are 10 cross-veins in front wing, 9 in the hind. Pterostigma very small, very oblique, dark greyish-brown in colour, but almost black in fully adult specimens; that of hind-wing decidedly shorter than that of front wing. Costal and proximal sides subequal in length; anal and distal sides simply curved, merging gradually into one another, the lower anal edge thus being not developed, especially not in front wing. Pterostigmata of both wings not nearly covering one underlying cell.

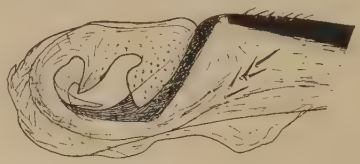

Fig. 6.—*Aciagrion fasciculare*, sp. n. ♂. Java. Penis in side view.

Abdomen excessively slender; terminal segments gradually a little widened in both dimensions. Ground-colour of segm. 1–2, base of 3, and 8–10 dark purple; sides of 3 gradually passing into yellowish-green; remaining segments pale greenish laterally. Entire dorsum of segm. 3–7 bronzed black; the markings are slightly widened before the end of each segment, and, basally, are narrowed to form on either side small greenish spots, confluent with the lateral pale colour. Segm. 8–9 wholly purple. Tenth segment at least partly black: in twelve out of fourteen specimens the dorsum bears a large bronzed marking touching both ends of segment, this marking being rather constricted at middle; in two other examples the dorsal black is confined to the basal half of the segment only. Tergal margins and sides of segm. 7–10 bluish-pruinose. Distal margin of segm. 10 deeply emarginate and a little elevated in the middle, the excavation blue interiorly.

In side view the structure of the penis is rather similar to that of *A. aciculare*, Lieft., and agrees with that species in having the apex of the third segment broadly rounded at middle, the sides, however, being greatly expanded and backwardly bent to form large, subtriangular end-lobes, each of which being closely beset with small groups of minute chagreen-like setae, still smaller and not tooth-like, as is the case in *aciculare*. Moreover, the internal spines, situated interiorly of the "elbow-joint," found in *aciculare*, *borneense* and *pallidum*, are entirely absent, while the two lateral marginal lobes are pointed and directed caudad. Exteriorly, there is an extremely thin and transparent membrane, spread between the tips of each of these lobes and the lateral chitinous margin of the more proximal portion of the penis, this membrane showing very fine, radiating, striae. In ventral aspect, the internal fold is broad and rounded, but viewed from aside it appears

very narrow, projecting well forwards. The distal part of the penis-shaft is armed with five strong setae, and on each side of the median ventral line there are about 6–7 setae of slenderer build (fig. 6).

Anal appendages black in colour, the interior surface paler. Superior pair in dorsal view thick at base, rather rounded, thence strongly tapering towards the apex, which is subacute. In profile view each appears straight and almost parallel-sided, with the lower margin hardly shorter than the upper, and with apices decidedly bifid. Inferiors shorter than upper pair; dorsal branch rounded, shining black, the lower obtuse, pale in colour (fig. 7).

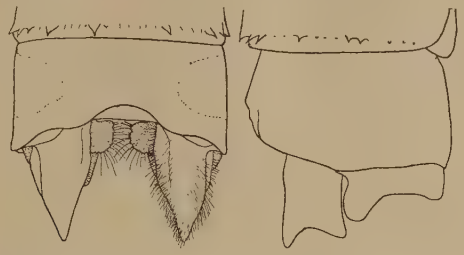

Fig. 7.—*Aciagrion fasciculare*, sp. n. ♂. Java. Anal appendages, dorsa and right lateral aspect.

Length: abd. + apps. 24–26; hind-wing 16–17 mm.
Female unknown.

Taken at various intervals by Dr. Toxopeus and myself among two or three shallow weedy marshes at the foot of densely forested hills. A very inconspicuous species, peculiar by its dull, purplish coloration. Differs from *aciculare*, Lieft., by its larger head, by the abdomen being less slenderly drawn out, and by the entirely different colour-pattern. There is also a very constant difference in the shape of the upper anal appendage of the male.

N.B.—To my description of *A. aciculare* (1929, *Tijdsch. Ent.*, **72**: 117–121) the following additions are required.

In the fully adult male the pale colours of the body are azure-blue. The black spots upon the head become more and more confluent with age, forming a rather broad and continuous band joining the eyes; this band reaches in front to a little before the median ocellus, its anterior border being strongly denticulate, the entire frons and an incomplete stripe along margin of compound eye being blue. On the middle of vertex some isolated pale spots among the ocelli are mostly well visible, the vivid blue postocular spots being very conspicuous. In such specimens the dorsum of synthorax bears a narrow, straight, median black band, the broad blue antehumeral stripes being a little wider than each of the halfs of the median fascia. The fine brown line along the upper half of the humeral suture, described for the type specimen, is almost complete, or nearly so, in mature examples, but linear and not sharply delimited below.

A. aciculare is not a common species except in the Botanic Garden and in the nature reserve Depok, between Batavia and Buitenzorg, where it is abundant. On Mt. Gedeh (up to 1000 m. alt.) it occurs sparingly in marshy forest. I have also received some typical examples from South Sumatra, taken by Dr. Van Steenis in the Ranau district.

NEUE STAPHYLINIDEN VON DEN NEUEN HEBRIDEN IM BRITISH MUSEUM

Von Dr. Max Bernhauer.
(*Horn, N. Oesterreich.*)

Lispinus santoensis, sp. n.

Diese Art steht dem *Lisp. castaneus*, Fauv., sehr nahe und unterscheidet sich von ihm durch stärkeren Glanz, beträchtlich kürzere Flügeldecken, lichtere Färbung und besonders durch die erloschene Punktierung, hinlänglich.

Die Färbung ist einförmig rötlichgelb. Der Kopf ist sehr fein und weitläufig punktiert, die Stirngrübchen sind gut ausgebildet, die Fühler sind mässig kurz, die vorletzten Glieder kaum breiter als lang. Der Halsschild ist um ein Drittel breiter als lang, wie der übrige Körper stark glänzend, nicht chagriniert, mit spärlicher, ziemlich erloschener Punktierung, auf der hinteren Hälfte mit zwei Längsfurchen, die seitlichen Furchen nicht sehr stark entwickelt. Die Flügeldecken sind mässig länger als der Halsschild, länger als zusammen breit, mit spärlicher, erloschener Punktierung. Der Hinterleib zeigt an der Wurzel und an den Seiten der einzelnen Tergite eine äusserst feine, aber bei starker Lupenvergrösserung immerhin deutliche netzartige Grundskulptur, ist jedoch dabei glänzend. Punktierung ist kaum vorhanden. Länge: 2 mm.

Santo, viii–ix.1929 (*L. E. Cheesman*).

Phloeonomus hebridensis, sp. n.

Von dem nahe verwandten *Phloeonomus singularis*, Kr., in nachfolgenden Punkten verschieden.

Der Körper ist etwas kleiner, die Färbung ist mehr bräunlichgelb die Flügeldecken sind am Hinterrand nicht schwärzlich sondern besitzen auf der Scherbe einen mehr oder minder ausgedehnten bräunlichen Nebelfleck, der Hinterleib ist etwas dunkler. Die Fühler sind beträchtlichkürzer, gegen die Spitze stärker verdickt, die vorletzten Glieder fast dreimal so breit als lang. Der Kopf ist ganz erloschen punktiert, der Halsschild ist in der Gestalt fast gleich, die Hinterecken etwas weniger scharf, die Eindrücke schwächer, die Oberseite stärker glänzend, im Grunde viel feiner chagriniert, viel feiner und nur sehr spärlich, erloschen punktiert. Auch die Flügeldecken sind viel feiner und weitläufiger punktiert, die Grundskulptur undeutlicher, der Glanz stärker. Der Hinterleib ist ziemlich glänzend, fast unpunktiert. Länge: 1·6–1·8 mm.

N.E. Malekula (*L. E. Cheesman*), 1930.

Oxytelus cheesmani, sp. n.

Dem *Oxytelus fallax*, Fauv., ausserordentlich nahe verwandt durch die viel dunklere Färbung sofort zu unterscheiden, über dies noch durch folgende Merkmale zu trennen.

Der Körper ist entschieden breiter, zugleich etwas grösser, der Halsschild ist etwas kürzer, nicht wie bei *fallax* fast etwas ausgeschweift, sondern sanft gerundet verengt, beträchtlich weitläufiger punktiert mit etwas weniger tiefen Eindrücken. Die Flügeldecken sind etwas weitläufiger punktiert.

Die Farbe ist pechschwarz, der Halsschild pechbraun bis rotbraun, die Flügeldecken dunkel rötlichgelb, die Beine hellgelb, die Fühler bräunlich. Länge: 3–3·5 mm.

Santo, viii–ix.1929 (*L. E. Cheesman*).

Paederus abnormalis, sp. n.

Eine kurzflügelige, durch die Färbung leicht kenntliche Art.

Lebhaft rotgelb, stark glänzend, die Hinterleibsspitze vom siebenten Tergit angefangen schwarz, die Flügeldecken bläulich, gegen die Wurzel zu mit violett-rötlichem Anflug, die Knie kaum angedunkelt.

Der Kopf ist mit den vorgequollenen Augen etwas breiter als der Halsschild, ziemlich regelmässig hexagonal, länger als breit hinter den Augen geradlinig verengt, mit flach verrundeten Hinterecken, ausserhalb der unpunktierten Mittelzone mässig stark, ungleich und weitläufig, in den Eindrücken zwischen den Augen kräftiger und dichter punktiert. Die Fühler sind gestreckt, die vorletzten Glieder, gegen die Spitze verdickt, ungefähr um die Hälfte länger als breit. Der Halsschild ist so breit als die Flügeldecken am Hinterrand, etwa um ein Viertel länger als breit, gewölbt, vor der Mitte am breitesten, nach rückwärts geradlinig und mässig stark verengt, ausserhalb der breiten unpunktierten Mittelzone spärlich und fein punktiert. Die Flügeldecken sind beträchtlich kürzer als der Halsschild, schmal, länger als breit, nach rückwärts mässig erweitert, kräftig und dicht, deutlich runzelig punktiert. Der Hinterleib ist fein und weitläufig punktiert. Länge: 7·5 mm.

N.E. Malekula (*L. E. Cheesman*), 1930.

Medon (Charichirus) neo-hebridarum, sp. n.

Die neue Art steht dem *Medon chinensis*, Boh., ungemein nahe, unterscheidet sich aber sicher durch folgende Merkmale:

Der Kopf ist etwas breiter und kürzer, viel stärker und weniger dicht punktiert, weniger matt, die Fühler sind beträchtlich dicker und kürzer, die vorletzten Glieder quer kugelig. Auch die Kiefertaster sind dicker und kürzer. Der Halsschild ist im Verhältnis zu den Flügeldecken schmäler, bedeutend weniger dicht punktiert, ziemlich glänzend, fast mit schwachem Erzschimmer, der glänzende Mittelkiel sehr reduziert, nur auf der hinteren Hälfte deutlich ausgebildet. Die Flügeldecken sind länger, fast um die Hälfte länger als der Halsschild, etwas stärker und weniger dicht punktiert als bei *chinensis*, Boh.

Die Färbung ist ebenso wie bei diesem etwas veränderlich. Schwarz, die Flügeldecken am Hinterrande entweder schmal rötlich gesäumt oder mit breiter rötlicher, an der Naht vorgezogener Zone, die Fühler, Taster und Beine düster rostgelb, die Hinterränder der Hinterleibsringe äusserst schmal rötlich gesäumt. Länge: 5·5 mm.

Tanner ix.1925 (*P. A. Buxton*); Malekula (Ounua) Feb. 1929 (*Miss L. E. Cheesman*).

Die vorstehende Art ist auch dem *Medon philippinus*, Bernh.* 1912, *Philipp. J. Sci.*, **7**: 250) verwandt, unterscheidet sich aber auch von diesem durch viel weniger dichte Punktierung und andere Färbung auf den ersten Blick.

Atheta (s.str.) **malekulana,** sp. n.

Rötlichgelb, gelblich behaart, am Hinterleib mit einzelnen schwarzen Borstenhaaren, vor der Hinterleibsspitze mit einem schwärzlichbraunen Ring, bei vollreifen Stücken auch der Kopf und die Flügeldecken geschwärzt.

Der Kopf ist ziemlich gross, nur mässig schmäler als der Halsschild, quer, sehr fein und mässig dicht punktiert, wenig glänzend, die Augen gross, die Schläfen sehr kurz, auf der Unterseite rückwärts gerandet. Die Fühler sind kurz, das dritte Glied so lang als das zweite, das vierte nicht, die folgenden deutlich quer, die vorletzten mehr als um die Hälfte breiter als lang, das Endglied fast so lang als die drei vorhergehenden zusammen genommen. Der Halsschild ist so breit als die Flügeldecken, um die Hälfte breiter als lang, an den Seiten sanft und ziemlich gleichmässig gerundet, äusserst fein und schwer sichtbar punktiert, vor dem Schildchen ohne Grübchen, die Epipleuren bei seitlicher Ansicht deutlich sichtbar. Die Flügeldecken sind um ein Viertel länger als der Halsschild, zusammen breiter als an der Naht lang, deutlicher als der Halsschild und dicht punktiert. Der Hinterleib ist gleich breit, an der Wurzel der drei ersten freiliegenden Tergite schwach quergefurcht, weniger fein als der Vorderkörper und wenig dicht, hinten spärlich punktiert, viel glänzender als der Vorderkörper. Länge: 2 mm.

Malekula (*L. E. Cheesman*), 1930.

* In demselben Journal wurde auch (1915, **10**: 121) neuerlich ein *Medon philippinus*, von mir beschrieben, dessen Namen ich nunmehr in **luzonicus,** nom. nov. abändere.

THE STAPHYLINID COLEOPTERA OF THE NEW HEBRIDES

By Malcolm Cameron, M.B., R.N., F.R.E.S.

The following pages are devoted to an enumeration of the beetles of the family Staphylinidae contained in the large collection formed by Miss L. E. Cheesman in the New Hebrides during 1929 and 1930. The collection was made under the auspices of the British Museum, where it is now to be found.

Oxytelinae.

Priochirus (Syncampsochirus) cheesmani, sp. n.

Near *samoensis*, Blanch., but differing in the following respects: the four teeth on the frontal margin are much smaller, the internal yet smaller than the external and separated from it by a shallow emargination, the thorax is shorter, more transverse and more convex, the sides distinctly retracted in front, the median groove wider and deeper. The antennae scarcely differ from those of *samoensis*; the reflexed sides of the thorax have each a row of six or seven punctures, smaller and more closely placed than in that species, the abdomen has a similar puncturation, namely two rows of very fine punctures, one at the base and one at the apex of each segment, otherwise practically impunctate. Length 9 mm.

Santo, vii, 1929.

Lispinus castaneus, Fauv.

Banks Is.: Vanua Lava, xi, 1929. Malekula: Malua Bay, vii, 1929.

Lispinus subopacus, Kr.

Banks Is.: Vanua Lava, xi, 1929.

Lispinus santoensis, Bernh.

Santo, viii, 1929. Malekula: Ounua, iii and iv, 1929.

Phloeonomus (s.str.) **cheesmani,** sp. n.

Greasy lustrous, the elytra more shining. Head reddish or reddish-brown, thorax yellowish-brown with lighter lateral margins; elytra brownish-yellow, the posterior margin and postero-external region blackish; abdomen brown, the apex lighter. Antennae black, the first five joints yellow. Legs yellow. Length 2 mm.

In build and colour very similar to *sumatrensis*, Bernh., but a little broader, thorax much more sparingly punctured, elytra more shining, sides of abdomen much more elevated. Strongly coriaceous, the head with a few fine punctures, thorax without or with only a feeble trace of dorsal impressions, the elytra nearly twice as long, much more closely and more strongly punctured. Abdomen sparingly and indistinctly punctured.

Tanna, ix, 1930.

Phloeonomus (s.str.) *hebridensis*, Bernh.

Tanna, ix, 1930.

Phloeonomus (s.str.) **fraternus,** sp. n.

Nearly opaque, the elytra and abdomen a little shining. Head and abdomen black, thorax reddish-brown, elytra brownish-yellow, the postero-external region blackish. Antennae black, the first two joints brownish-yellow. Legs yellow. Length 1·3 mm.

Of exactly the same build and lustre as *obscurus*, Kr., differs in the more transverse penultimate joints of the antennae, the colour of the thorax and elytra, the former equally closely but distinctly less finely punctured, the latter slightly longer and a little more coarsely punctured. In other respects similar to *obscurus*.

Tanna, ix, 1930. Unique.

Trogophloeus (Carpalimus) pakeanus, sp. n.

Shining, black, the elytra pitchy-black. Antennae black, the 1st joint and the legs yellowish-brown. Length 2 mm.

Head narrower than the thorax, the temples rounded, a good deal shorter than the eyes; front impressed on each side, puncturation close, moderately fine. Antennae with the 3rd joint about as long as the 2nd, 4th to 7th a little longer than broad, gradually decreasing in length, 8th transverse, 9th and 10th stouter, about as long as broad. Thorax transverse, the sides rounded and moderately dilated in front, retracted behind, before the base with a crescentic impression, in front on each side of the middle line with a small fovea and in the middle line itself nearer the anterior margin with another; puncturation on the disc very similar to that of the head, but at the sides much coarser and closer, somewhat rugose and finely umbilicate. Elytra broader and about a third longer than the thorax, distinctly impressed on each side near the base of the suture, externally near the humeral angle with a slighter impression; puncturation rather close and about as coarse as that on the sides of the thorax. Abdomen widened behind, coriaceous, finely and moderately closely punctured, finely and moderately closely grey pubescent.

Banks Is.: Pakea, x, 1929. Unique.

Paragonus sauteri, Bernh. var. **hebridensis,** var. n.

This form differs from the type in the pitchy black colour.

Banks Is.: Vanua Lava, x, 1929. Santo, viii, ix, 29. Also in the Philippines.

PAEDERINAE.

Palaminus australiae, Fauv. var. **hebridensis,** var. n.

This form has the elytra a little more closely and a little more finely punctured than the Australian examples, but in other respects is similar.

Aneityum, x, 1930.

Palaminus proximus, sp. n.

Shining, reddish-yellow, the abdomen ferruginous red. Antennae, palpi and legs pale yellow. Length 3 mm.

Colour of *australiae*, in build very similar but the thorax more retracted behind and with distinct basal impressions, the head less deeply and more finely punctured, the thorax more finely, more sparingly and more superficially punctured. Elytra twice as long as the thorax, the sculpture a little less close and less rugulose than in *australiae*, the anal styles a little longer and more slender.

Erromanga, vii, 1930 (Type). Tanna, x, 1930.

Paederus hebridensis, sp. n.

Shining, black, the scutellum greenish-black, elytra purple, here and there with greenish reflex. Antennae black, the first two joints reddish, the 11th orange-red. Palpi and legs (including the coxae), black. Length 12 mm.

Head a little longer than broad, the temples long, nearly straight, gradually retracted behind, eyes rather small, on each side internal to the eye with an impression, behind the

eyes with scattered larger and smaller punctures, the impressions punctured, otherwise smooth without ground-sculpture and with a few stiff black hairs and setae. Antennae long, all the joints longer than broad, the 11th as long as the 10th. Thorax oval, very finely and very sparingly punctured at the sides and with a few black hairs and setae, ground-sculpture absent. Scutellum less shining, very finely transversely strigose. Elytra as long and as broad as the thorax, convex, the sides very slightly rounded, moderately finely and moderately closely punctured, sparingly pubescent. Abdomen scarcely widened before the apex, narrowed behind, very finely, moderately closely punctured, finely pubescent and with a few fine black setae at the sides.

♂. 6th ventral segment narrowly and deeply emarginate.

Aneityum, xi, 1930. Unique.

Stilicopsis setigera, Shp.

Banks Is.: Vanua Lava, x, 1929.

Acanthoglossa brachycera, Kr.

Malekula: Atchin Is., vii, 1929.

Acanthoglossa pictipennis, sp. n.

♀. Rather shining: head ferruginous red; thorax black, the anterior angles obscurely reddish; elytra blackish with large triangular red marking occupying the whole of the base and extending nearly the whole length of the suture, the posterior margin and postero-external angle yellow; abdomen blackish, the posterior margin of the 7th rather broadly and nearly the whole of the 8th segments reddish-yellow. Antennae and legs reddish-yellow, the anterior femora infuscate. Length 3·75 mm.

Readily recognised by the colour. Head quadrate, broader than the thorax, the base truncate, the posterior angles briefly rounded, the puncturation rather fine, moderately close, not rugose, indistinctly umbilicate. Antennae rather short and slender, 3rd joint slightly longer than the 2nd, 4th to 6th slightly longer than broad, gradually decreasing in length, 7th to 10th transverse. Thorax trapezoidal, more finely but on the disc about as closely punctured as the head, towards the sides more sparingly. Elytra as broad as and about a fourth longer than the thorax, rather closely and more strongly punctured than the head. Abdomen moderately finely and moderately closely punctured, the pubescence greyish, longer and coarser than on the fore-parts. The sides of the insect with a few fine black setae.

♂ unknown.

Vila Efate, vi, 1930. Unique.

STAPHYLININAE.

Indoscitalinus taitensis, Boh.

Malekula: Ounua, iv, v, 1929.

Philonthus thermarum, Aubé.

Erromanga, vii, 1930.

Phucobius semiaereus, sp. n.

♀. Shining, black, the head, thorax and elytra with strong greenish-bronze reflex. Antennae black, the last two joints reddish. Legs black, the tarsi reddish. Length 10 mm.

Resembling *cupreipennis* but with differently coloured elytra, abdomen, legs and antennae. Head transverse, quadrate, as broad as the thorax, vertex on each side with a

row of three large punctures, the temples coarsely, rugosely punctured. Antennae slender, the intermediate joints longer than broad, gradually decreasing in length, the 9th and 10th about as long as broad. Thorax as long as broad, the sides straight, retracted behind, the anterior angles briefly, the posterior, broadly rounded, on each side of the middle with a row of four or five small punctures, the first three closely placed and separated by a space from the posterior. Scutellum coarsely punctured. Elytra a third longer and a little broader than the thorax, coarsely, closely and rugosely punctured. Abdomen with the first two (visible) segments lightly impressed on each side, moderately finely and moderately closely punctured.

N.E. Malekula, vii, 1929.

Tachyporinae.

Coproporus glaber, Fauv.

Banks Is.: Vanua Lava, xi, 1929.

Aleocharinae.

Gyrophaena subgenus **Acanthophaena,** subgen. n.

In the very large and prominent eyes resembles the subgen. *Phanerota*, Cas., of America, but differs in the sides of the abdomen in the males being appendiculate, whilst the 8th dorsal segment in the females is more or less forcipate or furnished with a tooth on each side. The mesosternal process is shorter than in *Gyrophaena* s.str. and *Phaenogyra*, extending only to about the middle of the coxae, whilst the metasternal process is correspondingly longer. The antennae are slender, the 3rd joint almost as long as the 2nd, the 4th longer than broad. It will include *appendiculata*, Motsch., and *rufiventris*, Cam., from India.

Gyrophaena (Acanthophaena) lamellata, sp. n.

Shining, black, in some examples dark reddish-brown, only the head and 6th abdominal segment black. Antennae and legs reddish-yellow. Length (extended) 2·5 mm.

Head only a little narrower than the thorax, the eyes very large and prominent occupying the whole of the side; on each side of the disc with a row of three small punctures. Antennae slender, the 3rd joint almost as long as the 2nd, 4th distinctly, 5th slightly longer than broad, the following about as long as broad, the 11th as long as the two preceding together. Thorax nearly twice as broad as long, the sides gently rounded, more retracted behind, on either side of the middle with a row of three small punctures, towards the sides with one or two others. Elytra a little broader and about a half longer than the thorax, with a few very fine punctures posteriorly and at the sides, elsewhere practically impunctate. Abdomen very finely and sparingly punctured.

♂. 4th abdominal segment on each side with small sub-triangular lamella: 5th with two appendages on each side, a stout, pointed, slightly curved spine overlying a narrow, slightly curved lamella with obliquely bisinuate apical margin, this plate is slightly longer than the spine: 7th at the middle of the posterior margin with a small tubercle: 8th with a triangular tooth on each side, the margin between rounded.

♀. 8th dorsal segment on each side with a triangular tooth (shorter than in the ♂), the margin between truncate.

Banks Is.: Vanua Lava, xi, 1929. Malekula: Ounua, iv, v, 1929.

Gyrophaena (s.str.) **ruficeps,** sp. n.

♀. Shining; head reddish, thorax and abdomen black, elytra brownish-yellow, blackish at the postero-external region. Antennae black, the first four joints reddish-yellow. Legs reddish-yellow. Length 2 mm.

Of the robust build of *nana*, Payk. Head rather broad but distinctly narrower than the thorax, at the sides with a few small punctures. Antennae stout, the 5th to 10th joints transverse. Thorax fully a third broader than long, on each side of the middle with a row of three small punctures of which the pre-basal are the largest, towards the sides with one or two others. Elytra a third longer and a little broader than the thorax, practically impunctate. Abdomen extremely finely and very sparingly punctured.

♂ unknown.

Malekula, i, 1930. Unique.

Gyrophaena (s.str.) **variabilis,** sp. n.

Shining, black, the elytra brownish-yellow, the postero-external region black; abdomen sometimes reddish at the base. Antennae reddish-yellow. Legs yellow. Length 1·5 to 2 mm.

Head rather broad but narrower than the thorax, on each side with a few moderate punctures. Antennae rather stout, the 4th joint small, 5th to 10th strongly transverse. Thorax about twice as broad as long, the sides evenly rounded, on the disc with four quadrately placed punctures, at the sides with one or two others. Elytra a little longer and broader than the thorax, finely and extremely sparingly punctured and (like the head and thorax) without ground-sculpture. Abdomen very finely and very sparingly punctured.

The ♂ characters are variable as regards the 3rd segment, which principally in the smaller examples is unmodified (var. n. **emasculata**), whilst in others the posterior margin is produced backwards as a very broad plate almost covering the following segment, with broadly rounded posterior margin, this margin presents the following modifications: (1) uniformly rounded; (2) furnished with a small emargination in the middle; (3) furnished with two small notches one on each side of the middle so as to form a small blunt median tooth (Type form); (4) median tooth produced with a long spine (var. n. **spinifera**). 8th dorsal segment with the posterior margin divided by two small excisions into three small lobes, the median one rounded, the lateral dentiform.

N.E. Malekula, vi, 1929 (Type). Ounua, ii, vi, 1929 (Type form and var. *emasculata*). Banks Is.: Vanua Lava, xi, 1929 (Type form and var. *spinifera*).

Placusa (s.str.) **hebridensis,** sp. n.

Moderately shining, head black, thorax dark brown, elytra brownish-yellow, indefinitely infuscate externally, abdomen pitchy-black, the base and apex sometimes obscurely lighter. Antennae black, the first three joints yellowish. Legs yellow. Length 1·75–2 mm.

In build and colour much like *pygmaea*, Kr., but on the average larger and more robust, the antennae longer and the abdomen much less finely punctured. Head narrower than the thorax, finely and closely punctured. Antennae with the 2nd and 3rd joints of equal length, the 4th to 10th transverse. Thorax almost twice as broad as long, the sides rounded, a little more retracted in front, the posterior angles obtuse, closely, finely, asperately punctured. Elytra a little longer and broader than the thorax, a little more closely and distinctly more roughly punctured. Abdomen parallel, closely finely and roughly punctured.

♂. 8th dorsal segment with a slender spine on each side, the margin between with four small teeth, occasionally with only a single central tooth with rudiments (sometimes asymmetrical) of the others.

Tanna, ix, 1930.

Thamiaraea insigniventris, Fauv. [*miriventris*, Cam. (*Atheta*)].

Malekula: Ounua, iii, iv, 1929.

NOTES ON THEOBALD'S "THE PLANTLICE OR APHIDIDAE OF GREAT BRITAIN," II & III

By D. Hille Ris Lambers.

(From the Entomological Laboratory, Wageningen, Holland.)

In continuation of an earlier paper * an attempt is here made to call attention to some errors in Volumes II and III of Theobald's monograph. Owing to the limited time available, I have only been able to examine those species that had puzzled me during a study of his work. I hope, however, to have another opportunity of going through the material dealt with in these volumes more intensively.

I also find that I have overlooked a few points in Volume I. Theobald's *Rhopalosiphoninus latysiphon* is not identical with the original species of Davis, of which I have since received material. Theobald's species seems to be *R. tulipaella*, Theo. I have not seen his material, but apterae of *latysiphon*, Davis, have no secondary rhinaria, whereas Theobald figures the antennae with one or more rhinaria. *R. latysiphon*, Davis, is also a subterranean species, whereas *R. latysiphon*, Theo., deforms the leaves of *Vinca*.

R. tulipaella, Theo., is, however, itself a synonym, for I discovered in 1933 that it is the summer-form of *R. staphyleae*, Koch, which migrates to tulips and several other plants.

Macrosiphum formicarium, Theo. (No. 15), is not identical with *Macrosiphoniella pseudolineata*, H.R.L., but with *M. sejuncta*, Wlk.

Aphis cynoglossi, Wlk., is included among the synonyms of *Myzus persicae*, Sulzer (Vol. I: 318). This is incomplete. One of Walker's specimens is mounted and has been identified by Laing as *M. persicae*, Sulzer, ♂, but it is a ♂ of *Amphorophora rubi*, Kalt. Another slide bearing the name *A. cynoglossi* contains *Myzus persicae*, Sulzer, 1 al. and 1 apt. vivipara. A third slide with the same name contains *Aspidaphis adjuvans*, Wlk.

Further, since the first part of this paper appeared, I have received a paper by Dr. Börner, in which he erects a new genus for the species of *Amphorophora* from *Ribes*, and named it *Hyperomyzus* †. I agree with this, as there is a considerable difference between *ampullata*, Buckt., and the *Ribes* infesting *Amphorophora*, which form a natural group.

1. *Cavariella*, Del Guercio, Theo. **2**: 3–17.
   In his key Theobald divides this genus into two parts according to the structure of the supracaudal process. This process is, however, not only very variable, but it may also look very different according to the way it is prepared, so that it is not a satisfactory character for taxonomic purposes. I consider *C. capreae*, F., to be a synonym of *C. pastinacae*, L., the latter having priority.
2. *Hyalopterus melanocephalus*, Buckt., Theo. **2**: 30–32.
   This should be named *Semiaphis cucubali* (Pass.), 1863, *Aph. Ital.*, p. 47. Another synonym is *Aphis silenea*, Ferr., 1872 (*Ann. Mus. Civ. Stor. nat. Genova*. **2**: 72).
3. *Pergandeida*, Schouteden, Theo. **2**: 32–35.
   This genus is considered to be a synonym of *Doralis*, L., for the present. (See No. 14.)
4. *P. stanilandi*, Laing, Theo. **2**: 34–35.

* 1933, *Stylops*, **2**, 169–176.

† 1933, Börner, C., Kleine Mitteilungen über Blattläuse. Selbstverlag des Verfassers. Naumberg (Saale). 4 pp.

Doralis (or *Aphis*) *urticaria*, Kalt., develops aberrations in summer with 5 antennal segments only; these are usually yellow, and Laing seems to have described them as a new species. The apterous males have 5 or 6 antennal segments.

5. *Longicaudus dilineatus*, Buckt., Theo. **2** : 38–40.
   In examining the material, I could find no difference between this species and *L. trirhodus*, Wlk., so therefore consider *dilineatus*, Buckt., to be a synonym of it.
6. *Hyadaphis xylostei*, Schrank, Theo. **2** : 52–54.
   Aphis xylostei, Schrank, 1801, is preoccupied by *Aphis xylosthei*, De Geer, 1773 (= *Prociphilus*). On discovering this, I gave it the name *Hyadaphis schranki*, H.R.L., 1931 (*Mem. Mus. Stor. Nat. Ven. Trident.*, **1** : 40–41), and Hottes named it *H. mellifera*, Hottes, for the same reason (1930, *Proc. Biol. Soc. Wash.*, **43** : 184), but Börner has since pointed out that the correct name is *Hyadaphis sii*, Koch (Sorauer, 1932, *Handb. Pflanzenkr.* **5** : 612).
7. *H. sparganii*, Theo. **2** : 55–56.
   This is only *Rhopalosiphum nymphaeae*, L., which infests all kinds of aquatic plants.
8. *H. coniellum*, Theo. **2** : 56–57.
   H. sii, Koch, migrates from *Lonicera* to Umbelliferae. Theobald described the migrants on *Conium* as a separate species under the name *H. coniellum*.
9. *Rhopalosiphum eriophori*, Wlk., Theo. **2** : 65–70.
   Börner described this species under the name *Ceruraphis viburnicola*, C.B. As it does not belong to the species of *Rhopalosiphum* with Rosaceae as secondary food-plants, the morphology and wax-excretion at the tip of the abdomen of which are quite characteristic, Börner's assignment of it to this genus appears to be correct, and its proper name should be *Ceruraphis eriophori*, Wlk. Other synonyms are *A. viburni*, Schrk., *nec* Scop., *A. junci*, Kalt. (1875), and *A. viburnicola*, Gill. (See also No. 19, *Aphis lantanaella*, Theo.)
10. *R. alboapicalis*, Theo. **2** : 70–71.
    This species is only *Cryptomyzus ribis* (L.)! The resemblance to *R. staphyleae*, Koch, is imaginary.
11. *R. rumicis*, Theo. **2** : 71–72.
    It is clear from Theobald's figure 30 that this is a *Cavariella*, *C. pastinacae*, L.
12. *R. prunifoliae*, Fitch, Theo. **2** : 72–77.
    Börner pointed out that this species in the sense of Theobald should be named *R. crataegellum*, Theo. The species from apple, pear, hawthorn, etc., is distinct from that on species of *Prunus*, which is *R. padi*, L. (1932, Börner *in* Sorauer, *loc. cit.* **5** : 594).
13. *R. foeniculi*, Pass., Theo. **2** : 77–78.
    I was unable to find any material of this species in the Theobald collection. Buckton's figure is of a *Cavariella*. There is a slide in his collection with "Fennel" in his handwriting on it, containing *Cavariella aegopodii*, Scop., but his figure looks more like *C. pastinacae*, L.
14. *Aphis*, L., Theo. **2** : 78–219.
    At present it is impossible to identify all the species of this genus with sufficient certainty. Börner has split it into *Doralis* and *Aphis*; the latter now contains *A. sambuci*, L., and *A. clematidis*, Koch, only. I must confine myself to a few remarks on certain readily recognisable species.
15. *A. sambuci*, L., Theo. **2** : 95–98.

Börner discovered the migration of this species to the parts of *Rumex* spp. above ground. I myself have only found them hitherto on subterranean ones. (See also Nos. 25 and 49.)

16. *A. rumicis*, L., Theo. **2** : 98–106.

Börner, Janisch and Franssen have published extensive papers on this and allied black Aphids. From these and also from my own observations, it is certain that on some species of dock two different black species are present, one being a migratory species with a nearly smooth skin, the other a non-migratory species with a strongly reticulated skin that gives rise to a pronounced leaf curl on *Rumex obtusifolius*. The continental authors gave the name *rumicis* to the typical non-migratory species and identified the other with the black bean aphis, *Aphis fabae*, Scop. Theobald, and many others with him, failed to distinguish between them, and they are in fact difficult to differentiate in balsam slides. The result is a misinterpretation of the biology. Theobald found eggs on *Rumex*, *Euonymus* and *Viburnum*, but those on *Rumex* are *Doralis rumicis*, L., and those on *Viburnum* and *Euonymus* are *D. fabae*, Scop.

The synonyms given by Theobald are not those of *D. rumicis*, L., in the sense of Börner, but of *D. fabae*, Scop. *Aphis ulicis*, F., which is among Theobald's synonyms, has never been described. Neither is *Ulex europaeus* one of the food-plants, though there is a black aphis living on *Ulex*, which is quite distinct.

The splitting of *D. fabae*, Scop., into *D. evonymi*, F., *D. viburni*, Scop., *D. philadelphi*, Börner, and *D. mordvilkoi*, Börner, may be entirely or partly right, but seems to me to be a matter of secondary importance. With the exception perhaps of *D. viburni*, Scop., which has apterous males, I should prefer to treat them as forms of *D. fabae*, Scop., with small differences in biology.

17. *Aphis viburni*, Scop., Theo. **2** : 114–116.

Theobald's typeslide (1925, Ent. Mon. Mag., **61** : 78, fig. 7) contains 1 al.viv. *viburni*, Scop., 1 ov. *viburni*, Scop., and 1 male of *Yezabura malifoliae*, Fitch (syn. *Anuraphis roseus*, Baker).

18. *Aphis lantanae*, Koch, Theo. **2** : 116–119.

This material is either *viburni*, Scop., or *fabae*, Scop., and at all events belongs to the *fabae*-group. What Koch's species is, I do not know.

19. *Aphis lantanaella*, Theo. **2** : 119–120.

This is *Ceruraphis eriophori*, Wlk., which migrates from *Viburnum* to *Carex*, *Eriophorum*, *Luzula* and *Typha*.

20. *Aphis laburni*, Kalt., Theo. **2** : 122–125.

This species lives on *Cytisus laburnum* only. It is characterised by the presence of a grey, waxy excretion. Allied species live on other Leguminosae, *Genista*, *Vicia cracca*, etc., but this group requires still further investigation.

21. *Aphis plantaginis*, Schrk., Theo. **2** : 129–132.

Theobald's material and description include several species. The one from *Achillea* and *Chrysanthemum* was described by v. d. Goot, and Börner redescribed it as *Toxoptera vandergooti*, as the media is forked once only. The remainder are still unidentified.

22. *Aphis symphyti*, Schrk., Theo. **2** : 132–133.

According to Börner, this species is the same as *Doralis rhamni*, B.d.F., which migrates from *Rhamnus* to several herbaceous plants. He considers *D. gossypii*, Glover, to be a synonym also.

23. *Aphis nasturtii*, Kalt., Theo. **2** : 139–140.
= *D. symphyti*, Schrk.
24. *Aphis gossypii*, Glover, Theo. **2** : 141–145.
A synonym of *D. symphyti*, Schrk., according to Börner.
25. *Aphis sambucaria*, Pass., Theo. **2** : 149–152.
= Autumn migrants of *A. sambuci*, L.
26. *Aphis neopolygoni*, Theo. **2** : 160–161.
A. polygoni, v. d. Goot = *D. symphyti*, Schrk., but Theobald's *neopolygoni* may be a distinct species.
27. *Aphis avenae*, F., Theo. **2** : 161–165.
Aphis avenae, F., seems to be what was formerly known as *Macrosiphum granarium*, Kirby (Mordvilko, Nevsky, Börner, H.R.L.). Theobald's species is *Rhopalosiphum padi*, L. Börner has dealt with the misunderstanding concerning this species. (1932, Sorauer, *Handb. Pflanzenkr.*, **5** : 593–594).
28. *Aphis solanina*, Pass., Theo. **2** : 166–168.
= *D. symphyti*, Schrk.
29. *Aphis callunae*, Theo. **2** : 188–189.
I have found this species in Holland on *Calluna* and *Vaccinium myrtillus*. *Aphis ericae*, Wlk., which I have also taken, is a distinct species. Börner redescribed it from *Erica gracilis* as a new species, *Myzaphis ericae*, Börner. It is rare on *Erica vulgaris* in Holland, but may cause serious damage where it occurs. There is no doubt that it is a *Myzaphis*.
30. *Aphis dallmani*, Theo. **2** : 192–193.
This is not an *Aphis*, but a *Macrosiphum*. It comes near *M.* (*Sitobion*) *avenae*, F., or *M. rubiellum*, Theo., but the preparation is not good enough to allow one to decide which.
31. *Aphis rhamni*, B.d.F., Theo. **2** : 199–202.
This is a synonym of *D. symphyti*, Schrk.
32. *Aphis infuscata*, Koch, Theo. **2** : 204–206.
This is the spring form of *Rhopalosiphum nymphaeae*, L., the summer form of which lives on aquatic plants.
33. *Aphis crataegella*, Theo. **2** : 206–207.
= *Rhopalosiphum crataegellum*, Theo. (See No. 12.)
34. *Aphis erysimi*, Kalt., Theo. **2** : 207–209.
Mordvilko erected the genus *Lipaphis* for this species. As Theobald rightly remarks, *erysimi*, Kalt., closely resembles *R. pseudobrassicae*, Davis, which also belongs in *Lipaphis*.
35. *Aphidiella*, Theo. **2** : 219–220.
The genotype, *A. secretocauda*, Theo., of which one specimen only exists, is a *Macrosiphum* that seems to have moulted abnormally. The ecdysis of the cauda is incomplete, so that what Theobald figured is the cauda of the last larval stadium; the cauda of the adult is indistinctly but completely visible in his slide, but it makes a right angle with the axis of the body. I think that the species is *Macrosiphum* (*Sitobion*) *avenae*, F.
36. *Anuraphis*, Del Guercio, Theo. **2** : 220–310.
Theobald's *Anuraphis* is in my view a very composite genus. Del Guercio appears to have had the same views as Theobald, judging by his paper on this subject in 1931, *Redia*, **19** : 309–501.
To make my views clear it is necessary to give a short account of the group. The genotype of *Anuraphis* is Koch's *pyri*. This is a species

with small spines on the siphunculi and a row of spinal tubercles on the head and all abdominal segments. Walker's *Aphis subterranea*, which migrates from *Pyrus communis*, also has the same characters. There is a second group on *Sorbus*, *Crataegus*, *Pyrus*, etc., with secondary host-plants, that have normal siphunculi and tubercles on the head and last abdominal segments only. This is van der Goot's genus *Dentatus*, which, being preoccupied, should be called *Yezabura*, Matsumura. Several well-known species belong in this genus, such as *Y. tulipae*, B.d.F., on bulbs and *Y. malifoliae*, Fitch, on apple, etc. A third group has no spinal tubercles at all and is named *Brachycaudus*, v. d. Goot, *B. cardui*, L., and *B. helichrysi*, Kalt., being important pests of plum. This last group does not infest pip fruits such as apples, etc. These 3 genera have a few characters in common. The alate forms always have a trapezoid black sclerotic area on the disc of the abdomen, and the primary food-plant is always one of the Rosaceae. (If they do not migrate and live on a herbaceous plant, they may be considered as being derived from a cycle, the primary food-plant of which has been one of the Rosaceae.) They thus form a natural group to which also several genera erected by Börner belong.

The cauda is always short, but all the species with a short cauda do not necessarily belong to this group. Here lies the mistake made by Theobald, Del Guercio and several others, and there is evidence of this in the fact that Theobald includes *exul*, Wlk., in his genus *Anuraphis*. Now *exul* is the autumn migrant of *Aphis sambuci*, L., *i.e.* the genotype of *Aphis*, L. These migrants indeed have a short and rounded cauda, but lack all the typical characters of the natural group : *Anuraphis—Brachycaudus—Yezabura*. The species which Theobald deals with are distributed over these groups as follows.

37. *A. kochi*, Schout., Theo. **2** : 227–228.
Theobald's material is *Yezabura pyri*, B.d.F.

38. *A. amygdali*, Buckt., Theo. **2** : 228–231.
This is preoccupied by *A. amygdali*, Blanchard = *Brachycaudus schwartzi*, Börner.

39. *A. angelicae*, Koch, Theo. **2** : 231–232.
= *Yezabura angelicae*, Koch.

40. *A. cardui*, L., Theo. **2** : 233–236.
= *Brachycaudus cardui*, L.

41. *A. cynariella*, Theo. **2** : 236–237.
= larva of *B. cardui*, L.

42. *A. insititiae*, Koch, Theo. **2** : 237–238.
= *Brachycaudus insititiae*, Koch.

43. *A. tulipae*, B.d.F., Theo. **2** : 238–244.
= *Yezabura tulipae*, B.d.F. Theobald records it also from *Daucus*, but this is another species, *Y. crataegi*, Kalt.

44. *A. dauci*, F., Theo. **2** : 244–245.
Aphis dauci, F., does not belong to this group but is a *Semiaphis*, which v. d. Goot described as *Semiaphis carotae*, Koch, in error. Theobald's species is *Yezabura crataegi*, Kalt.

45. *A. helichrysi*, Kalt., Theo. **2** : 245–260.
= *Brachycaudus helichrysi*, Kalt.

46. *A. ulmariae*, Schrk., Theo. **2** : 260–261.
= *Doralis ulmariae*, Schrk. There is also a *Brachycaudus* on *Ulmaria* and *Spiraea*, which is *B. spiraeae*, Börner.

47. *A. lappae*, Koch, Theo. **2** : 262–263.
= *Yezabura lappae*, Koch.
48. *A. prunifex*, Theo. **2** : 263–264.
= *Brachycaudus prunifex*, Theo.
49. *A. exul*, Wlk., Theo. **2** : 264–265.
= *Aphis sambuci*, L.
50. *A. tragopogonis*, Kalt., Theo. **2** : 265–267.
= *Brachycaudus tragopogonis*, Kalt.
51. *A. lychnidis*, L., Theo. **2** : 267–270.
= *Brachycaudus lychnidis*, L.
52. *A. rumicella*, Theo. **2** : 270–271.
= *Yezabura radicola*, Mordv.
53. *A. verbenae*, Macchiati, Theo. **2** : 271–273.
Theobald's material is *Brachycaudus helichrysi*, Kalt. This may or may not be Macchiati's species.
54. *A. achilleae*, F., Theo. **2** : 273–274.
Theobald's material is *Brachycaudus helichrysi*, Kalt. What Fabricius' species is, I am unable to make out, and nobody has yet recognised it.
55. *A. sherardiae*, Theo. **2** : 275–276.
= *Brachycaudus helichrysi*, Kalt.
56. *A. leontodoniella*, Theo. **2** : 276–277.
This is an unidentified species of *Yezabura*.
57. *A. subterranea*, Wlk., Theo. **2** : 277–280.
Theobald records this species from many plants, but I found material from *Pastinaca* and *Pimpinella* only in his collection. These two plants, with *Heracleum*, are the only food-plants yet known. The species is a true *Anuraphis*. It migrates from *Pyrus communis* to roots of Umbelliferae.
58. *A. farfarae*, Koch, Theo. **2** : 281–283.
= *Anuraphis farfarae*, Koch. It migrates from pear to *Tussilago* and is also known as *A. pyri*, Koch (preoccupied).
59. *A. tanacetina*, Wlk., Theo. **2** : 283–284.
I have not seen Walker's slides, but there are two of Buckton's, labelled *tanaceticola* in the B.M. collection, which Laing thought were *tanacetina*. These are *Brachycaudus helichrysi*, Kalt.
60. *A. bellis*, Buckt., Theo. **2** : 285–286.
= *Brachycaudus helichrysi*, Kalt.
61. *A. instabilis*, Buckt., Theo. **2** : 289–290; **3** : 349.
= *Brachycaudus cardui*, L.
62. *A. sorbi*, Kalt., Theo. **2** : 292–294.
= *Yezabura sorbi*, Kalt.
63. *A. roseus*, Baker, Theo. **2** : 294–301.
= *Yezabura malifoliae*, Fitch.
64. *A. heraclei*, Koch, Theo. **2** : 301–302.
Theobald's *heraclei* is *Yezabura crataegi*, Kalt. Koch's *heraclei* is *Anuraphis subterranea*, Wlk.
65. *A. crataegi*, Kalt., Theo. **2** : 302–305.
I omitted to make notes of Theobald's material, and these are essential to disentangle the complex of species involved in his description.
66. *A. ranunculi*, Kalt., Theo. **2** : 305–307.
= *Yezabura ranunculi*, Kalt. The records on *Taraxacum* and *Rumex* refer to other species.

67. *A. aucupariae*, Buckt., Theo. **2** : 308.
= *Yezabura aucupariae*, Buckt.

68. *Brachycolus frequens*, Wlk., 1848, Theo. **2** : 317–319.
Syn. *B. holci*, Hardy, 1850. Careful measurements of both species make it impossible to come to any other conclusion.

69. *Toxoptera*, Koch, Theo. **2** : 319–324.
Theobald includes two species, *T. graminum*, Rond., and *T. typhae*, Laing. I agree with Börner that the correct generic name for these species is *Schizaphis*, Börner. He also points out that in the species of *Rhopalosiphum* that migrate from Rosaceae to Gramineae, there is a tendency to develop a media with one fork. In the structure of the head these species closely resemble the "*Toxoptera*" species on Monocotyledons. It is therefore logical to consider them as derived from *Rhopalosiphum* in contrast to the true *Toxoptera aurantiae*, B.d.F.

70. *Toxoptera typhae*, Laing, Theo. **2** : 323–324.
= *T. scirpi*, Pass. I have recently found it on both *Scirpus* and *Typha*.

71. *Neoacaudus*, Theo. **2** : 326–327.
Theobald states that he erected this genus for a single perfect specimen, mounted in balsam, "type in Miss Jackson's collection." This is, in fact, present in the B.M. collection, and it answers to Theobald's description.
The single specimen, found on potato, proves to be a badly mounted aptera of *Brachycaudus helichrysi*, Kalt. The cauda is completely curved under the body so that the posterior margin of the body is formed by the 8th abdominal segment. Here two spinal hairs are broken, and their bases appear to have been mistaken by Theobald for tubercles, though their structure is quite distinct.
Consequently *Neoacaudus*, Theo., must be considered a synonym of *Brachycaudus*, v. d. Goot, the genotype, *bipapillata*, Theo. = *helichrysi*, Kalt., being a typical *Brachycaudus*.

72. *Myzocallis minimus*, v. d. Goot, Theo. **2** : 352–355.
= *Myzocallis betulae*, Buckt. (See No. 102.)

73. *Monaphis antennata*, Kalt., Theo. **2** : 395–397.
I found this species in 1933 in great numbers for the first time. Though other authors have recorded the existence of apterous females, I doubt the existence of true apterous viviparous forms because, when my "apterous females" were boiled in lactic acid, small wing-pads invariably became visible.

74. *Macrosiphum schranki*, Theo. **2** : 403, footnote.
Siphonophora carnosa, Buckt., is identical with Schrank's *A. urticae*, and as the latter is preoccupied, takes its place. Theobald overlooked this and proposed *M. schranki* as a new name for *M. urticae*.

75. *Aphis padi*, L., Theo. **2** : 403–404.
My opinion of *A. padi*, L., differs from that of Theobald. Linnaeus gave no description of his *padi*, but quoted the figures of Réaumur, which represent *Hyalopterus arundinis*, F., and *Brachycaudus helichrysi*, Kalt., on plum. Linnaeus added one more food-plant, *Prunus padus*, and gave the name *Aphis padi*. Notwithstanding the quotation of Réaumur, I suppose that he had in mind a species from *Prunus padus*, and this must have been the species which is really typical for *Prunus padus*, i.e. a *Rhopalosiphum*, known as *R. padi*, L. Otherwise he would have used the name *Aphis pruni*, as was his custom. Börner follows the same reasoning.

76. *Anuraphis crithmi*, Buckt., Theo. **2** : 405–406.
= *Brachycaudus helichrysi*, Kalt.

77. *Anuraphis masseei*, Theo. **2** : 406.
Belongs to *Brachycaudus*, v.d.G., and is closely allied to, but distinct from, *B. cardui*, L.

78. *Sipha schoutedeni*, Del Guercio, Theo. **3** : 3–6.
Kaltenbach says that his species *glyceriae* has minute spines all over it, and Del Guercio was therefore in error in stating that Kaltenbach's species was smooth. Del Guercio's name for the spinose species is consequently a synonym of *S. glyceriae*, Kalt., as has already been pointed out by Mordvilko.

79. *Chaitophorus vitellinae*, Schrk., Theo. **3** : 19–20.
This is not Schrank's species, which I have erroneously described as new under the name *C. anuraphoides*, H.R.L. The true *vitellinae*, Schrk., lives on the branches as his description states. What Theobald's species is, I cannot say with certainty.

80. *Periphyllus horridus*, Theo. **3** : 44–45.
The short flagellum (= processus terminalis) of this species is characteristic of the fundatrices of this genus. *P. horridus* seems to me to be the fundatrix of *P. testudinatus*, Thornton. Great importance was attached to the structure of the cornicles in a letter which I received from Prof. Theobald. I am inclined to consider that the irregular structure of the opening is the result of an injury.

81. *Pterocommina*, Theo. **3** : 48–60.
I agree with Börner in considering *Melanoxantherium* a synonym of *Pterocomma*. The difference is supposed to be based on the cylindrical or swollen siphunculi. This character is very variable, and most of the species might be placed in both genera.

82. *Pterocomma populea*, Kalt., Theo. **3** : 50–52.
The form on willow is quite distinct from that on poplar, and is known as *P. pilosa*, Buckt.

83. *Pterocomma bituberculata*, Theo. **3** : 52–54.
This species is a very interesting one, because it has a very abnormal siphuncular form. This same porus is found in the American species, *P. flocculosa*, Weed, which is placed in the genus *Plocamaphis*, Oestl., in which Theobald's species should also be put.

84–86. *Pterocomma jacksoni*, Theo. **3** : 54–55, *P. fraxini*, Theo. **3** : 55–56, and *P. bicolor*, Laing *nec* Oestl., Theo. **3** : 56.
These are all synonyms of *P. steinpeili*, Mordv.

87. *Protrama radicis*, Kalt., Theo. **3** : 97.
The correct name for this species is *radicum*, B.d.F. Kaltenbach himself states that this seems to be his *radicis*.

88. *Protrama donisthorpei*, Theo. **3** : 100–101.
I can find no difference in the material studied between this species and *P. radicum*, B.d.F.

89. *Neotrama formicella*, Theo. **3** : 102.
= *Protrama radicum*, B.d.F.

90, 91. *Macrosiphum picridis*, F., Theo. **3** : 322–324 and *nigrocampanulae*, Theo. **3** : 324–325.
These both belong to *Dactynotus*, Raf.

92. *Macrosiphoniella triglochiniella*, Theo. **3** : 325–327.
= *Macrosiphum* (*Sitobion*) *avenae*, F.

93. *Amphorophora digitalisii*, Theo. **3** : 328–329.
Closely allied to, and possibly only an alate form of *rubi*, Kalt.
94. *Rhopalosiphoninus tuberculatus*, Theo. **3** : 330–331.
= *Hyperomyzus rhinanthi*, Schout.
95. *Myzus morisoni*, Laing, Theo. **3** : 336.
= *Myzus papillata*, Theo.
96. *Myzus quasipyrinus*, Theo. **3** : 337–338.
= *Myzus cerasi*, F.
97. *Rhopalosiphum lahorensis*, Das, Theo. **3** : 339–341.
= *Coloradoa rufomaculata*, Wilson.
98. *Aphis pyrastri*, Boisd., Theo. **3** : 341–342.
= *Piraphis streili*, Börner.
99. *Aphis podagrariae*, Schrk., Theo. **3** : 345.
Just as in the case of *A. rumicis*, L., two species occur on *Aegopodium*. One, *Doralis aegopodii*, Schrk., lives on *Aegopodium* only and causes a very typical leaf deformation. It forms sexuales on *Aegopodium* and is quite common, especially in the South of Europe. Morphologically it is readily distinguished, by the presence of very long hairs, from the other species, *Doralis fabae*, Scop., which infests the inflorescences and does not cause any damage.
100. *Neoacaudus inflatus*, Theo. **3** : 345–346.
This proved to be a parasitised larva of *Macrosiphoniella artemisiae*, B.d.F. Fig. 208 shows the larva of the parasite very distinctly; its head is turned to the left.
101. *Anuraphis pyriella*, Theo. **3** : 346–347.
= *Anuraphis farfarae*, Koch.
102. *Chaitophorus betulae*, Buckt., Theo. **3** : 349.
= *Myzocallis betulae*, Buckt. Another synonym of this species is *Subcallipterus minimus*, v. d. Goot.

In conclusion I have to thank Mr. A. W. McKenny-Hughes of the British Museum, and the Editor, Dr. S. A. Neave, for their work in checking this and the previous paper and putting them into correct English.

TWO ICHNEUMONIDS (HYM.) NEW TO BRITAIN

By A. Roman.

(*Stockholm.*)

The Cryptinae here described were sent me for identification by Dr. Ch. Ferrière, of the Imperial Institute of Entomology, and this paper has been written at his request.

Isadelphus clausus (Thoms., *Hemiteles*).

In 1923, *Ent. Mon. Mag.*, **59**: 30, I published the description of *Cecidonomus carri* ♀ with closed areolet, and now its next ally, the above species, has also proved to occur in England. It was taken by Mr. G. T. Lockley in Chelsea, London, in April 1933, while ovipositing in sycamore. Originally C. G. Thomson described the species from the province of Skåne (Scania) in southernmost Sweden, but I have found it to be tolerably common near Stockholm on the trunks of Scotch fir and birch and to hibernate in numbers beneath the loose bark at base of old firs. Habitually it is like the common *I. inimicus*, Gr., but is slenderer, with the head less thick and more narrowed behind the eyes, has the areolet always closed (as in *carri*) and the red colour on middle of abdomen

more obsolete. In small females abdomen and coxae may be almost totally black. The male is not described, but I have found it swarming with the female on birch trunks in June and September. It may be described thus :—

♂ magnitudine, capite angustato areolaque clausa feminae similis, at antennis subrectis, flagelli articulis 10–11 tyloideis linearibus extus munitis, abdomine angustiore segmento 2 subelongato (in ♀ leviter transverso), hoc cum 3 basi rufis vel uti coxis totis nigris, discedens.

That this species belongs to the genus *Isadelphus*, Foerst. (type : " *Echthrus* " *armatus*, Gr.) in Britain known as *Cecidonomus*, Bridg., is shown by the finely alutaceous head, mesonotum and abdomen, the simple collar of pronotum, the antefurcal nervellus and the thin, more or less long and distinctly decurved terebra. Against these characters the closed areolet takes only a specific importance, shared by a couple of other species, *westoni*, Bridg. (*Cecidonomus*) and *pimplarius*, Thoms. (*Phygadeuon*). No host is yet known.

Hemiteles wesmaeliicida, sp. n.

Tubney Wood, Berks. (*F. J. Killington*). Emerged 10 June, 1932, in 2 ♀♀ 1 ♂ as parasites on *Wesmaelius quadrifasciatus*. One large cream-coloured ectoparasite was found fastened to the back of the prepupa.

♀. Nigra, basi postannelli et mandibulari, palpis, ima basi femorum anteriorum, calcaribus, radice alari tegulisque, testaceis vel albidis, femoribus obscure tibiisque rufis, ventre, tarsis—basi metatarsi excepta—, nervis stigmateque alarum fuscis, his ceterum hyalinis. Long. vix 4, ala antica 3, valvulae terebrae 1–1·2 mm.

Caput pone oculos fortius arcuatim angustatum, a fronte visum subtriangulare, opacum temporibus, clypeo et genis nitidioribus, his mandibularum basi longioribus. Antennae arcuata thoracem superantes filiformes, apice ipso subacuminato, articulis omnibus elongatis, flagello 21-articulato postannello latitudine apicali 4·5 ×, quam articulum sequentem parum longiore.—*Thorax* altitudine vix dimidio longior leviter compressus vix capitis latitudine, opacus speculo polito, mesonoto et scutello sat convexis, illo notaulis postice obsoletis, sternaulis rectis postice minus distinctis; segm. medianum (propodeum) opacum breve area postica medium superante, area basali cum centrali confluente, hoc lateribus aperta, costa laterali nulla.—*Abdomen* capite et thorace nonnihil longius, depressum lanceolatum, segmentis tribus primis opacis, jam a basi triangulari, latitudine apicali sublongiore, spiraculis in medio sitis, carinis dorsalibus subobsoletis, 2 leviter transverso limbo apicali incrassato nitido, 3 parallelo 2 paullo breviore apice ± late nitido, segmentis ceteris nitidis sensim angustatis, terebra sat gracili longe acuminata, valvulis longitudine segmentorum 2 + 3.—*Pedes* subgraciles, femoribus III latitudine circiter 5 × longioribus, tibiis I gracilibus, ungue III articulo 4 parum longiore, unguiculis parvis gracilibus.—*Alae* abdomen nonnihil superantes, radii basi curvo mox ante medium stigmatis egrediente, nervis basali et discocubitali divergentibus, hoc leviter fracto, nervo 2 recurrente valde obliquo, nervello antefurcati longe inferne fracto, abscissula nervo recurrenti aequilongo, hamulis 4–5.

♂ differt antennis rectis subsetaceis, postannello vix 4 × longiore quam latiore (tyloideis non visis), thorace capitis latitudine, segm. mediano costa laterali completa, abdomine parallelo, segmento 1 latitudine apicali fere duplo longiore carinis dorsalibus magis distinctis, 2 subelongato, 3 subtransverso nitidulo (plica ventrali albida 2). Long. corporis et alae anticae 4 mm.

This species belongs to the *floricolator*-group and seems to stand next to *albipalpus*, Thoms., but the terebra is almost twice longer and the ♂ ocelli are not perceptibly larger than in the ♀. The fact that it was bred from a Neuropteron is interesting and may give a clue to the parasitism of the whole group of species.

NEW SPECIES OF CERAMBYCIDAE (COL.) FROM JAVA

By W. S. Fisher.

(*Associate Entomologist, Bureau of Entomology, U.S. Dept. Agric.*)

This paper is the result of a study of a collection of beetles, mostly belonging to the genus *Exocentrus*, Mulsant, received from Dr. L. G. E. Kalshoven, Forest Entomologist, Buitenzorg, Java.

My sincere thanks are extended to Doctor Kalshoven for the privilege of studying this interesting collection of Cerambycidae and for his kindness in permitting me to deposit in the United States National Museum collection types of the new species collected by himself.

Platyzeargyra javana, sp. n.

Elongate, rather robust, feebly shining; above and beneath dark brown or black, the elytra more or less pale yellow at bases (the yellow colour forming a narrow vitta extending obliquely backward from the humeral angle to the middle of each elytron at basal fourth in the type), and ornamented with distinct cinereous pubescent designs.

Head strongly transverse and convex in front, with a vague, narrow, longitudinal carina, which is more distinct near the epistoma; surface rather densely, coarsely punctate, the punctures distinctly separated, moderately clothed with short, recumbent, brownish pubescence, with numerous long, erect, fine hairs intermixed; mandibles reddish-brown, with the tips black; palpi luteous; eyes divided, lower lobes rounded and strongly convex, upper lobes very small, separated from each other on the top by one-half the distance that separates the lower lobes on the front. Antenna one and one-half times as long as the body, uniformly brownish-black, rather densely clothed with short, recumbent, inconspicuous pubescence (whitish on the fifth joint), with a few longer, erect hairs intermixed, and densely ciliate beneath with long, erect, fine, blackish hairs; first joint long, moderately robust, extending to middle of pronotum, subequal in length to the third joint, which is slightly longer than the fourth, the following joints gradually diminishing in length.

Pronotum subequal in length and width, distinctly narrower at base than at apex; sides nearly parallel or vaguely sinuate from apical angles to basal fourth, where they are slightly constricted; surface feebly, transversely depressed along base and anterior margin, rather densely, coarsely punctate except along base, sparsely clothed with short, recumbent, inconspicuous, brownish pubescence, with numerous long, erect, inconspicuous, blackish hairs intermixed.

Elytra three times as long as pronotum, and at base slightly wider than pronotum at apex; sides parallel from base to apical fourth, then arcuately narrowed to the tips, which are separately narrowly rounded; disk strongly convex posteriorly, strongly flattened on basal halves; surface sparsely, coarsely punctate, the punctures widely separated and more or less arranged in rows on the basal halves, but becoming obsolete behind the middle, rather densely clothed with short, recumbent, inconspicuous, blackish pubescence (brownish on apical fourth and yellowish on pale basal areas), with numerous long, erect, fine, black hairs intermixed, and each elytron ornamented with whitish pubescence as follows: A transversely angulated fascia in front of middle and a broad, transverse fascia at apical fourth.

Beneath vaguely punctate, sparsely clothed with short, recumbent, inconspicuous pubescence, with a few long, erect hairs on the legs; last abdominal segment broadly rounded at apex.

Length, 3·75–5·75 mm.; width, 1·2–1·75 mm.

Type locality.—Java: Batoerraden (*G. Slamet*).

Type and paratype.—In the F. C. Drescher collection. *Paratype.*—In U.S. National Museum, Washington.

Described from three specimens, probably all males (one type). The type and one paratype were collected at the type locality 22 February, 1932, by F. C. Drescher, and one paratype was collected 10 April, 1932, at Batoerraden, by the same collector.

This species is allied to *bakeri*, Fisher, but it differs from that species in being more sparsely and inconspicuously pubescent, and in having the basal halves of the elytra strongly flattened and more or less pale yellow.

Key to the species of Exocentrus, *Mulsant, from Java.*

1. Pronotum at least one-half wider than long . . . . . 2.
   Pronotum not one-half wider than long . . . . . 5.
2. Each elytron with a conspicuous dark area behind the middle . . . . 3.
   Each elytron without a conspicuous dark area behind the middle *tectonae*, Fisher.
3. Pronotum strongly angulated and produced on each side in front of the lateral tooth . . . . . 4.
   Pronotum not angulated or produced on each side in front of the lateral tooth . . . . . *bauhiniae*, Fisher.
4. Pubescent spots on the elytra distinct and separated from each other, especially behind the dark area . . . . . *actinophorae*, Fisher.
   Pubescent spots on the elytra more or less confused . . *kalshoveni*, Fisher.
5. Elytra with distinct, long, stiff, erect hairs; anterior coxae nearly contiguous 6.
   Elytra without distinct, long, stiff, erect hairs; anterior coxae widely separated . . . . . *artocarpi*, Fisher.
6. Pronotum with a long, acute, lateral tooth on each side near the middle; elytra not very coarsely punctate, the punctures becoming obsolete toward apices, pubescent spots narrow . . . . . *drescheri*, Fisher.
   Pronotum with a short, acute, lateral tooth on each side toward the base; elytra coarsely punctate over entire surface, the pubescent spots broader and more distinct . . . . . *insularis*, Fisher.

Exocentrus tectonae, sp. n.

Male.—Above and beneath uniformly yellowish-brown, and each elytron ornamented with yellowish-white pubescent markings.

Head slightly convex in front, subequal in width to the pronotum at apex, flat between the antennal tubercles; surface finely, densely granulose, densely clothed with long, recumbent, yellowish-white pubescence, with a few long, erect, black hairs intermixed; eyes separated from each other on the top by twice the width of the upper lobe. Antenna slightly longer than the body, uniformly pale yellowish-brown, sparsely clothed with short, recumbent, brownish pubescence, with a few long, erect hairs intermixed, densely ciliate beneath with long, erect, blackish hairs, the joints broadly annulated at bases with white pubescence; first joint subequal in length to the third joint, which is slightly longer than the fourth.

Pronotum one and one-half times as wide as long, slightly narrower at base than at apex, widest along middle; sides arcuately narrowed anteriorly, parallel along the middle to a small, acute tooth on each side just behind the middle (tooth short, rather robust, and pointing directly backward), then strongly, arcuately narrowed to the base; surface slightly convex, feebly, broadly, transversely depressed along base and anterior margin, finely, densely granulose, rather densely clothed with long, recumbent, yellowish-white pubescence, with a few long, erect, stiff, black hairs intermixed.

Elytra four times as long as pronotum; surface rather densely, coarsely, irregularly

punctate basally, the punctures becoming obsolete toward the apices, rather densely clothed with short, recumbent, brownish and yellowish-white pubescence, the whitish pubescence forming irregularly distributed, somewhat elongate, more or less confused spots on the basal halves, the spots more confluent at the middle and forming a more distinct, transverse, whitish fascia on each elytron, the brown pubescence predominating behind the middle, where the whitish pubescent spots are less numerous, more elongate, and separated from each other, the surface with numerous long, erect, stiff, black hairs or setae.

Beneath rather densely clothed with long, recumbent, whitish pubescence, with numerous long, erect, stiff hairs on the legs, last abdominal segment feebly convex and broadly rounded at apex.

Female.—Differs from the male in having the antennae slightly shorter, the last abdominal segment strongly convex, broadly subtruncate and narrowly, transversely depressed at apex, with a feeble, narrow, longitudinal, smooth, median carina.

Length, 4·5–5·5 mm.; width, 1·75–2·25 mm.

Type locality.—Java: Semarang. *Other locality.*—Java: Rembang.

Type.—In U.S. National Museum, Washington. *Paratypes.*—In Zoological Museum, Buitenzorg.

Described from five specimens (one ♂, type). The type was reared 28 October, 1927, from dead teak (*Tectona grandis*) collected in the teak forest at Semarang by L. G. E. Kalshoven; one paratype was reared during December 1922 from dead *Mallopis* sp., collected in the same locality by L. G. E. Kalshoven; one paratype was collected in the teak forest at Semarang, 27 November, 1928, at trap light, by the same collector; and two paratypes were collected at Rembang 5 and 27 May, 1926, by Fr. A. Th. H. Verbeek.

This species is allied to *hirtus*, Fisher, but it differs from that species in having the eyes more widely separated on the top of the head, the elytra irregularly punctured, but the punctures not forming longitudinal rows.

Exocentrus bauhiniae, sp. n.

Female.—Above and beneath uniformly yellowish or reddish-brown, the antennae and legs in part paler, and each elytron ornamented with longitudinal, yellowish-white pubescent vittae, with a distinct dark area behind the middle.

Head nearly flat in front, subequal in width to the pronotum at apex, feebly, broadly concave between the antennal tubercles; surface finely, sparsely granulose, the granules well separated, rather densely clothed with long, recumbent, yellowish-white pubescence, with a few long, erect hairs intermixed; eyes separated from each other on the top by nearly twice the width of the upper lobe. Antenna slightly longer than the body, yellowish-brown, with the bases of the joints vaguely paler, sparsely clothed with short, recumbent, whitish pubescence, with a few long, erect hairs intermixed, densely ciliate beneath with long, erect, blackish hairs; first joint slightly longer than the third joint, which is subequal in length to the fourth.

Pronotum one and one-half times as wide as long, subequal in width at base and apex, widest at middle; sides obliquely expanded from the apical angles to a small, acute tooth on each side just behind the middle (tooth short, rather robust, and pointing obliquely backward), then strongly, obliquely constricted to the base; surface feebly convex, vaguely, broadly, transversely depressed along base and anterior margin, finely, densely granulose, rather densely clothed with long, recumbent, yellowish-white pubescence, with a few long, erect, black hairs intermixed.

Elytra three and one-half times as long as pronotum; surface coarsely, irregularly punctate, the punctures dense on basal halves, but becoming sparser toward apices, rather

densely clothed with moderately long, recumbent, inconspicuous, brown pubescence, with numerous long, erect, stiff, black hairs or setae intermixed, and each elytron ornamented with four or five rather broad, longitudinal, whitish pubescent vittae, which are interrupted behind the middle by a distinct dark area.

Beneath sparsely clothed with moderately long, recumbent, whitish pubescence, with numerous long, erect, stiff hairs on the legs and apical part of the last abdominal segment, which is strongly convex, feebly, broadly, arcuately emarginate or subtruncate at apex, with a narrow, longitudinal, smooth, median carina.

Male.—Differs from the female in having the antennae slightly longer, the last abdominal segment feebly convex, broadly rounded or subtruncate at apex and without a median carina.

Length, 4·25–5·5 mm.; width, 1·5–2·25 mm.

Type locality.—Java: Kediri. *Other localities.*—Java: Semarang; Buitenzorg; Gedangan; and Djeroeklegi, Zuid-Banjoemas.

Type and paratype.—In U.S. National Museum, Washington. *Paratypes.*—In Zoological Museum, Buitenzorg, and in the F. C. Drescher collection.

Described from eight specimens (one type). The type (♀) was collected at the type locality during 1924 by L. G. E. Kalshoven; one paratype was collected in the teak forest at Semarang, 7 March, 1925, by L. G. E. Kalshoven one paratype was reared during 1924, from dead *Mangifera odorata* collected at Buitenzorg, by L. G. E. Kalshoven; four paratypes were reared during March and April 1933, from dead "kendajakan" (*Bauhinia malabarica*), collected at Gedangan, by L. G. E. Kalshoven; and one paratype was collected at Djeroeklegi, Zuid-Banjoemas, 23 October, 1931, by F. C. Drescher.

This species resembles *vittatus*, Fisher, but it differs from that species in having the elytra irregularly punctate and the punctures not arranged in longitudinal rows, and in having the white pubescent vittae interrupted on each elytron behind the middle by a distinct dark area.

Exocentrus actinophorae, sp. n.

Male.—Above and beneath dark brown, with the bases of the antennal joints, bases of tibiae, and anterior and posterior margins of pronotum slightly paler, and each elytron irregularly ornamented with elongate, whitish pubescent spots, with a distinct dark area behind the middle.

Head slightly convex in front, subequal in width to pronotum at apex, flat between the antennal tubercles; surface finely, sparsely granulose, the granules well separated, sparsely clothed with long, recumbent, whitish pubescence, with a few long, erect, black hairs intermixed; eyes separated from each other on the top by a little more than twice the width of the upper lobe. Antenna about one and one-fourth times as long as the body, dark brown, with the bases of the joints slightly paler, sparsely clothed with short, recumbent, inconspicuous pubescence, with a few long, erect hairs intermixed, and densely ciliate beneath with long, erect, blackish hairs; first joint subequal in length to the third joint, which is distinctly longer than the fourth.

Pronotum twice as wide as long, slightly narrower at base than at apex, widest at middle; sides strongly, arcuately rounded from apical angles to a rather large, acute tooth on each side just behind the middle (tooth rather long, and pointing obliquely backward), then strongly, arcuately constricted to the base; surface feebly convex, narrowly, transversely depressed along anterior margin, broadly, transversely concave along base, finely, rather densely granulose, rather densely clothed with long, recumbent, brownish and whitish pubescence, with a few long, erect, stiff, black hairs intermixed, the white pubescence forming a more or less distinct longitudinal vitta on each side of the middle.

Elytra four times as long as pronotum; surface coarsely, irregularly punctate basally, the punctures becoming obsolete toward the apices, rather densely clothed with short, inconspicuous, brown pubescence, with numerous long, erect, stiff, black hairs or setae intermixed, and each elytron irregularly ornamented with distinctly separated, broadly elongate, whitish pubescent spots, with a distinct dark area behind the middle.

Beneath densely clothed with long, recumbent, whitish pubescence, with numerous long, erect, stiff hairs on the legs; last abdominal segment feebly convex, broadly subtruncate at apex.

Female.—Differs from the male in having the antennae slightly shorter, the last abdominal segment strongly convex, feebly, broadly, arcuately emarginate at apex, with a feeble, narrow, longitudinal, smooth, median carina.

Length, 3·5–4 mm.; width, 1·25–1·5 mm.

Type locality.—Java: Semarang. *Other locality.*—Java: Madioen and Rembang.

Type and paratype.—In U.S. National Museum, Washington. *Paratypes.*—In Zoological Museum, Buitenzorg.

Described from six specimens (one ♂, type). The type and two paratypes were reared during June 1931 from dead *Grewia paniculata* and *Actinophora fragrans* collected in the teak forest at Semarang, by L. G. E. Kalshoven; one paratype was collected at Rembang, during 1928, by Fr. A. Th. H. Verbeek; and two paratypes were collected at Madioen, 13 May, 1929, by the same collector.

This species is allied to *tectonae*, Fisher, but it differs from that species in having a distinct dark area on each elytron behind the middle.

Exocentrus kalshoveni, sp. n.

Male.—Above uniformly reddish-brown, the antennae in part slightly paler, and each elytron irregularly ornamented with whitish pubescence, with a distinct dark area behind the middle; beneath slightly more yellowish than above, especially the basal halves of the femora and tibiae.

Head nearly flat in front, slightly narrower than pronotum at apex, feebly, broadly concave between the antennal tubercles; surface finely, rather densely granulose, rather densely clothed with long, recumbent, whitish pubescence, with numerous long, erect, black hairs intermixed; eyes separated from each other on the top by the width of the upper lobe. Antenna slightly longer than the body, rather robust, dark brown, with the first joint and bases of following two or three joints paler, sparsely clothed with short, recumbent, inconspicuous pubescence, with numerous longer, erect hairs intermixed, and densely ciliate beneath with long, erect, blackish hairs; first joint slightly longer than the third joint, which is subequal in length to the fourth.

Pronotum one and three-fourths times as wide as long, subequal in width at base and apex, widest at middle; sides obliquely expanded from apical angles to the middle, with a large, narrow, acute tooth on each side just behind the middle (tooth long, and pointing obliquely backward), then strongly, arcuately constricted to the base; surface feebly convex, vaguely, broadly, transversely depressed along base and anterior margin, finely, densely granulose, rather densely, irregularly clothed with long, recumbent, whitish pubescence, with a few long, erect, black hairs intermixed.

Elytra nearly four times as long as pronotum; disk somewhat uneven; surface coarsely punctate, the punctures denser and more or less arranged in longitudinal rows on basal halves, but becoming sparser toward the apices, rather densely clothed with long, recumbent, brownish and whitish pubescence, with numerous long, erect, stiff, black hairs inter-

mixed, the whitish pubescence forming more or less distinct broad vittae on basal halves, the vittae nearly confluent laterally, and each elytron with a distinct dark area behind the middle.

Beneath densely clothed with long, recumbent, whitish pubescence, with numerous long, erect, stiff hairs on the legs; last abdominal segment feebly convex, broadly rounded or subtruncate at apex.

Female.—Differs from the male in having the antennae slightly shorter, the last abdominal segment strongly convex, feebly, broadly, arcuately emarginate at apex, with a feeble, narrow, longitudinal, smooth, median carina.

Length, 5–5·5 mm.; width, 2–2·25 mm.

Type locality.—Java: Rembang. *Other locality.*—Java: Bjeroeklegi, Zuid-Banjoemas.

Type.—In U.S. National Museum, Washington. *Paratypes.*—In Zoological Museum, Buitenzorg, and in the F. C. Drescher collection.

Described from four specimens (one ♂, type). The type and two paratypes were collected at the type locality, 11, 12, and 25 June, 1927, by Fr. A. Th. H. Verbeek; and one paratype was collected at Djeroeklegi, 21 June, 1930, by F. C. Drescher.

This species is allied to *actinophorae*, Fisher, but it differs from that species in having the whitish pubescent spots more or less confluent, and not distinctly separated from each other, especially behind the dark area on each elytron.

Exocentrus artocarpi, sp. n.

Female.—Above dark reddish-brown, antennae and anterior and posterior margins of pronotum paler, and each elytron irregularly ornamented with whitish pubescence, with a distinct dark area near middle at lateral margin; beneath dark reddish-brown, with the median part of the body and bases of femora and tibiae paler.

Head slightly convex in front, subequal in width to the pronotum at apex, flat between the antennal tubercles; surface finely, rather densely granulose, rather densely clothed with moderately long, recumbent, yellowish-white pubescence, but without long, erect hairs intermixed; eyes separated from each other on the top by nearly twice the width of the upper lobe. Antenna nearly one and one-half times as long as the body, uniformly yellowish-brown, sparsely clothed with short, inconspicuous pubescence, and sparsely ciliate beneath with moderately long, erect, blackish hairs; first joint distinctly shorter than the fourth joint, which is slightly longer than the third.

Pronotum subequal in length and width, equal in width at base and apex, widest at middle; sides parallel, with a large, acute tooth on each side at middle (tooth long, robust at base, acute at apex, and pointing obliquely backward); surface strongly convex, vaguely, broadly, transversely depressed along base, very densely, finely granulose, sparsely clothed with rather short, recumbent, brownish and whitish pubescence, the whitish pubescence denser toward the sides, forming a narrow, longitudinal, median vitta, but the surface without long, erect hairs.

Elytra three times as long as the pronotum; disk rather strongly convex, slightly flattened in front of middle; surface rather finely, irregularly, sparsely punctate, the punctures becoming obsolete near the apices, rather densely clothed with moderately long, recumbent, brownish and whitish pubescence, with a few rather short, erect hairs intermixed, the whitish pubescence forming numerous irregular-shaped spots, giving the surface a variegated appearance, and each elytron with a distinct dark area near the middle at lateral margin.

Beneath sparsely clothed with moderately long, recumbent, inconspicuous pubescence,

but without distinct long, erect hairs on the legs; last abdominal segment strongly convex, feebly, broadly, arcuately emarginate at apex, deeply, abruptly depressed at the apical margin; anterior coxae widely separated.

Male.—Differs from the female in having the last abdominal segment feebly convex, broadly rounded or subtruncate at apex.

Length, 3·75–4·75 mm.; width, 1·25–1·75 mm.

Type locality.—Java: Buitenzorg. *Other locality.*—Java: Semarang. *Type and paratype.*—In U.S. National Museum, Washington. *Paratypes.*—In Zoological Museum, Buitenzorg.

Described from six specimens (one ♀, type). The type and three paratypes were reared during March and April 1931 from dead *Artocarpus integra* and *Ficus variegata* collected at the type locality by L. G. E. Kalshoven; and two paratypes were collected in the teak forest at Semarang, during August 1931, by the same collector.

This species differs from all other known species of this genus described from Java (except *insularis*, Fisher) in having the anterior coxae widely separated, and in not being clothed with distinct, long, erect, stiff black hairs or setae.

Exocentrus drescheri, sp. n.

Female.—Small, strongly shining, dark brown or black, the elytra and anterior and posterior margins of the pronotum slightly more reddish, the elytra sparsely, irregularly ornamented with narrow, elongate, whitish pubescent spots.

Head slightly convex in front, subequal in width to the pronotum at apex, flat between the antennal tubercles; surface finely, rather densely granulose, sparsely clothed with short, recumbent, inconspicuous pubescence, with a few long, erect hairs intermixed; eyes separated from each other on the top by twice the width of the upper lobe. Antenna slightly longer than the body, uniformly dark brown, sparsely clothed with short, recumbent, brownish pubescence, with a few longer, erect hairs intermixed, and densely ciliate beneath with long, erect, blackish hairs; first joint distinctly longer than the third joint, which is subequal in length to the fourth.

Pronotum about one and one-third times as wide as long, slightly narrower at base than at apex, widest at middle; sides obliquely expanded from the apical angles to a large, acute tooth on each side just behind the middle (tooth long, slender, and pointing obliquely backward), then strongly, arcuately constricted to the base; surface feebly convex, distinctly, broadly, transversely concave along base, finely, densely granulose, sparsely clothed with short, inconspicuous pubescence, with a more or less distinct whitish pubescent spot on each side of the middle.

Elytra four times as long as pronotum; surface coarsely punctate, the punctures denser and more or less arranged in rows on basal halves, but becoming obsolete toward the apices, sparsely clothed with short, recumbent, brownish, inconspicuous pubescence, with a few long, erect, stiff, black hairs or setae intermixed, and sparsely, irregularly ornamented with narrow, elongate, whitish pubescent spots.

Beneath sparsely clothed with moderately long, recumbent, whitish pubescence, with a few short, erect hairs on the legs; last abdominal segment strongly convex, feebly, broadly, arcuately emarginate or subtruncate at apex, with a feeble, narrow, longitudinal, smooth, median carina.

Male.—Differs from the female in having the last abdominal segment feebly convex, broadly rounded or subtruncate at apex, but without a median carina.

Length, 3·75–4 mm.; width, 1–1·5 mm.

Type locality.—Java : Batoerraden (*G. Slamat*).

Type and paratypes.—In the F. C. Drescher collection. *Paratypes.*—In U.S. National Museum, Washington.

Described from six specimens (one ♀, type), collected at the type locality by F. C. Drescher. The type was collected 24 April, 1932; two paratypes were collected during April 1932; and three paratypes were collected 1 May, 1928.

This species resembles *moerens*, Pascoe, very closely, but it differs from that species in having the pronotum confluently punctured, the elytra more strongly shining, the pubescence sparser, and the white pubescent spots on the elytra narrower and less distinct.

Exocentrus insularis, sp. n.

Female.—Above and beneath uniformly reddish-brown, rather strongly shining, the elytra irregularly ornamented with elongate, whitish pubescent spots, and each elytron with a distinct dark area behind the middle.

Head slightly convex in front, slightly wider than pronotum at apex, feebly, broadly concave between the antennal tubercles; surface finely, rather densely granulose, sparsely clothed with moderately long, recumbent, yellowish pubescence, with a few long, erect hairs intermixed; eyes separated from each other on the top by twice the width of the upper lobe. Antenna about as long as the body, robust, uniformly dark reddish-brown, rather densely clothed with short, recumbent, inconspicuous pubescence, with a few longer, erect hairs intermixed, and rather densely ciliate beneath with long, erect, blackish hairs; first joint distinctly longer than the third joint, which is subequal in length to the fourth.

Pronotum one and one-third times as wide as long, slightly narrower at base than at apex, widest at middle; sides feebly, obliquely expanded from the apical angles to a rather small, acute tooth on each side just behind the middle (tooth short, slender, and pointing obliquely backward), then strongly, obliquely constricted to the base; surface moderately convex, broadly, transversely concave along base, finely, densely granulose, sparsely clothed with short, inconspicuous pubescence, with a few long, erect hairs intermixed, and with a vague, elongate, whitish pubescent spot on each side of the middle.

Elytra four times as long as pronotum; surface rather densely, coarsely, irregularly punctate from bases to apices, sparsely clothed with short, recumbent, brownish, inconspicuous pubescence, with numerous long, erect, stiff, black hairs or setae intermixed, and each elytron sparsely, irregularly ornamented with moderately wide, elongate, whitish pubescent spots, which form a more or less distinct, sinuate, transverse fascia just behind the middle, with a more or less distinct dark area behind the transverse fascia.

Beneath sparsely clothed with rather short, recumbent, whitish pubescence, which is denser along the posterior margins of the abdominal segments; last abdominal segment strongly convex, feebly, broadly, arcuately emarginate or subtruncate at apex, with a narrow, longitudinal, smooth, median carina.

Length, 4·5 mm.; width, 1·5 mm.

Type locality.—Banka Island : Mount Mangkol.

Type.—In U.S. National Museum, Washington.

Described from a unique ♀, which was collected at the type locality at an altitude of 200 m., 9 June, 1930 (*J. v. d. Vecht*).

This species is allied to *drescheri*, Fisher, but differs from that species in having the short tooth on each side of the pronotum placed closer to the base, the elytra coarsely punctured over the entire surface, and in having the white pubescent spots on the elytra broader and more distinct.

THE GENUS *TABANUS* IN TASMANIA

By G. H. Hardy.

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All the species of *Tabanus* known from Tasmania belong to subgenus *Therioplectes*, Zeller, the group XI of Ricardo. No recent collection shows the presence there of any other section, although there are records of such in the older literature, and these are now regarded as erroneous.

The late E. W. Ferguson has pointed out that *Therioplectes* may be regarded as of Antarctic origin and the rest of the genus be due to invasion from the north, but it seems probable that some of the Australian forms that do not have hairy eyes are really variations of the same Antarctic group or groups. The fact remains, however, that Tasmania retains in its species the clue to the very vexed question as to how these flies are to be classified.

It is well known that the subgenus is difficult to deal with because of the abundance of apparent intermediate forms between certain species, nevertheless, in Tasmania, this difficulty does not occur, for every species so far described can be distinguished with comparative ease, and can be placed in a natural group quite easily. In Australia there are species belonging to the same groups and others belonging to groups that have yet to be formed. Hitherto these natural groups have not been distinguished owing to the complexity in the literature. The species were often compared with other species that did not belong to the same group and the comparisons with their natural allies were neglected. This gives a false idea of the complexity of the subject, which it is the purpose here to simplify.

I have before me all the species recorded from Tasmania, and nearly all the material has been through the hands of Ferguson, much of it bearing his identification labels; the remainder, left in abeyance by him, I have suitably placed.

Key to the Tasmanian species of Tabanus.

1. Fourth radial vein with an appendix . . . . . 2.
   Fourth radial vein without an appendix (*microdonta*-group)
   microdonta, Macquart.
   wynyardensis, Hardy.
2. Eyes of female at the anterior corners, separated by a space as wide as, or but slightly wider than, that at the summit; *i.e.* between the four eye corners, the frons is parallel-sided . . . . . 3.
   Eyes of female conspicuously diverging towards the antennae, so that the frons between the anterior corners is about half as wide again as at the summit, or more . . . . . 9.
3. The frons between the eye corners on female, about four times as long as wide (—— group) . . . . . *basii*, Ferguson.
   The frons between the eye corners on female, about three times as long as wide or less (*exulans*-group) . . . . . 4.
4. Callus on frons of female separated from the eyes by a pulverulent strip . 5.
   Callus on frons of female reaching from eye to eye . . . . . 6.
5. Body covered with a uniform pulverulent brownish-yellow (sand colour), the ground-colour and markings being thus obscured . . *vetustus*, Walker.
   Body not so covered, the markings being conspicuous . *neocirrus* Ricardo.

6. Hair on eyes of female yellowish-brown, the colour being very conspicuous *exulans*, Erichson.
   Hair on eyes of female white . . . . . 7.
7. Hair on frons of female rather long, longer than half the width of the frons *antecedens*, Walker.
   Hair on frons short. Large species . . . . . 8.
8. Black and brown ground-colour of abdomen interrupted by only a median line of spots . . . . . *circumdatus*, Walker.
   Blackish or brownish abdomen, rather variegated, and three lines of dorsal spots traceable, the outer ones being oblique *acutipalpis*, Macquart.
9. Thorax with well-defined dorsal black markings; four stripes anteriorly and three posteriorly on a grey ground (*regisgeorgii*-group) *diemanensis*, Ferguson.
   Thorax with rather indefined markings on dorsum; two to five light thin stripes on a general black ground . . . . . 10.
10. Thorax with a median light stripe on dorsum, as well as two pair placed laterally. Wings with four fuscous spots (*gentilis*-group) *gentilis*, Erichson.
    Thorax never with a median stripe. Wings without fuscous spots, although veins may be slightly bordered with fuscous (*gregarius*-group) . . . 11.
11. Callus separated from eyes by a pulverulent strip . *tasmanicus*, Ferguson.
    Callus reaching from eye to eye . . . . . 12.
12. Costal border of wings rather strongly bordered with fuscous *gregarius*, Erichson.
    Costal border of wings not suffused with fuscous . . . . . 13.
13. Hair on frons, including that on swelling just above antennae, unusually long and abundant . . . . . *neolatifrons*, Ferg. & Hill.
    Hair on frons normal, that on swelling just above antennae being scanty and short, or absent . . . . . 14.
14. Frontal callus small, not extending as far as halfway between the four eye corners . . . . . *hobartensis*, White.
    Frontal callus large, extending beyond halfway between the four eye corners . . . . . *imperfectus*, Walker.

The above key contains no matter liable to cause confusion, except that occasionally doubt may be raised whether the eyes are divergent or not in couplet 2. Sometimes, behind the summit of the head, an unduly strong indentation marks a partial collapse bringing the eyes, at this point, closer together than normal, but as far as I have yet found, such cases mainly occur in *T. antecedens*, and otherwise are infrequent. These cases are invariably indicated by the indentation at the rear of the summit and hence understood.

Tabanus microdonta group.

This group is readily recognised by the hairy eyes and the absence of the recurrent veinlet near the base of the fourth radial vein. There are, in it, only two species known to me, *T. microdonta*, Macquart, 1847, and *T. wynyardensis*, Hardy, 1916. The latter is only known from three males and appears like a a very small form of the former of which there are quite a number of both sexes known. The two forms may yet prove to be conspecific.

Tabanus exulans group.

Eyes hairy, frons, between the eye corners, parallel-sided or approximately so, rather broad and about three times longer than the width. Dorsum of

thorax with inconspicuous markings, these being three broad dark stripes and three narrower light ones. Wings with an appendix on the fourth radial vein and without markings.

In this group difficulty may be experienced in determining how far the callus of the frons extends. Ferguson has given some drawings without stating how he came to define their limits. The apparent nature of the callus depends not upon the callus itself, but upon the amount of pulverulent covering that may have been rubbed away. In order to obviate any such difficulty, the following alternative for couplets 4 to 7, will be helpful and perhaps preferable.

4. Palpi distinctly with black hairs. Hair on frons longer than usual . . . 5.
   Palpi with only white hairs. Hair on frons short . . . . . 6.
5. Seen in profile, the line of the frons on female stands conspicuously in advance of the eyes . . . . . *neocirrus*, Ricardo.
   Seen in profile the line of the frons on female lies level with that of the eyes; the callus may be prominent, however . . . . . *antecedens*, Walker.
6. Body covered with a uniform pulverulent brownish-yellow (sand colour), the ground-colour and markings being obscured . . . . . *vetustus*, Walker.
   Body not so covered . . . . . 7.
7. Hair on eyes of female yellowish-brown, the colour being very conspicuous *exulans*, Erichson.
   Hair on eyes of female white . . . . . 8.

Some specimens named *T. circumdatus* from Sydney and Canberra have some black hairs on the palpi, but not those from Melbourne, so it does not seem likely that this character will be found consistent for mainland specimens. Also this alternative section of the key brings *neocirrus*, Ricardo, and *antecedens*, Walker, together, and indeed they appear very much alike, the former, however, is smaller, a little shorter-haired on the frons and quite distinct in the frontal callus.

Tabanus acutipalpis, Macquart.

Macquart, 1838, 131; Walker, 1854, 251; Ricardo, 1915, 281; Ferguson, 1921*a*, 17; 1921*b*, 376.

There seems to have been some confusion between two apparently distinct species, one being larger than the other. Neither Ricardo nor Ferguson, both of whom have seen Macquart's material, have given characters adequate enough to separate the forms.

This is the largest species of the group and has a rather obscure oblique light patch each side of the median light patch on all abdominal segments, and although many are brown they have a different tint to that of *T. circumdatus*.

Eight females before me are from Bruni Island, Hobart, Wedge Bay, Dunalley, Maria Island and Strahan. Ferguson records it from the adjacent mainland of Victoria and from various islands, including Kangaroo Island, South Australia.

Tabanus circumdatus, Walker.

Walker, 1848, 185; 1854, 258; White, 1915, 14; Ricardo, 1915, 280; 1917, 222; Taylor, 1918, 67; 1919, 67; Ferguson & Henry, 1919, 846; Ferguson, 1921*a*, 16; 1921*b*, 373.

The species was described without locality, but the name was attributed by Ricardo and White to the Tasmanian form, and the former has added a number of synonyms. It seems to me that some of the mainland specimens attributed to the same species are not conspecific with those of Tasmania, but

it would require considerable field work to obtain the necessary material for working out the differences.

The Tasmanian form is only slightly smaller than the prior species, the abdomen being much less wide and less flattened, distinctly reddish-brown and black and with only a median light interrupted stripe. It is generally distributed through the island; two specimens from Strahan show its wide western range.

According to literature the species extends to Western Australia and to Sydney, where it is very variable in size and is difficult to distinguish at times from *T. edentulus*, but difficulties of this nature are not apparent on the Tasmanian forms.

Tabanus antecedens, Walker.

T. antecedens, Walker, 1848, 178; 1854, 250, 253; White, 1915, 9; Ricardo, 1915, 279; Taylor, 1916, 759; 1918, 67; Ferguson, 1921*a*, 18; 1921*b*, 374.
? T. endentulus, Macquart, 1845, 34; Walker, 1854, 251; Ricardo, 1915, 281; *nec* White 1915.

Although Ferguson considered *T. edentulus*, Macquart, should be attributed to Walker's species, he retained the name as used by White for another species, his purpose being to await further information.

Another complication is the suggestion that the name *T. antecedens* is invalid for the present form, for Walker gave the name first to a male from Australia, and later gave the name to a female from Tasmania, the latter being a species confined to the island and hence cannot be conspecific with the male, which remains unrecognised. The name is left awaiting the necessary information that would permit this matter to be adequately rectified.

In distribution, the species is known to me only from the south-eastern quarter of the island, reaching to the Great Lake district, but it probably extends everywhere northward. It is unknown from Western Tasmania, nor did I secure any from Wynward where I made a special effort to secure all the Tabanids. *T. neocirrus*, Ricardo, may have been confused with it in certain districts.

Tabanus exulans, Erichson.

T. exulans, Erichson, 1842, 270; Walker, 1854, 252; White, 1915, 16; Ricardo, 1915, 275 (*esculans*).
T. edentulus, White, 1915, 10; Taylor, 1917, 526; 1918, 67; Ferguson & Henry, 1919, 846; Ferguson, 1921*a*, 17; 1921*b*, 374; ? *nec* Macquart, 1848.

According to Ferguson, *T. edentulus*, Macquart, has white hairs on the eyes, and as *T. edentulus*, White, has distinctly yellow-brown hairs, it seems obvious the two forms are not conspecific. On the other hand *T. exulans*, Erichson, is described as having cinereous hairs, which is a character applied by early authors to "white with a shade of brown" (see definition, Kirby & Spence, *Introduction to Entomology*, 4th edit. 1828). Other Tasmanian species having the eye hairs similarly coloured are few and do not agree with the remainder of Erichson's description.

An investigation into all forms from the mainland that have had the name *T. edentulus* applied to them has not yet been undertaken, and possibly a complex will be found there, but specimens from Melbourne seem to be conspecific with those of Tasmania.

From the mainland forms of *T. circumdatus*, these Melbourne specimens are to be distinguished by the less dense and less regular fringe of lateral hairs on the posterior tibiae, a character that certainly aids in separating them,

but I do not know if it remains consistent as is the case with the Tasmanian forms.

Tabanus neocirrus, Ricardo.

Ricardo, 1917, 222; Ferguson, 1921*b*, 375.

Ferguson drew attention to the two specimens, described under this name by Ricardo, as being probably not conspecific, and that the second specimen was returned to the South Australian Museum, not the Tasmanian species which was published as being the type. Ferguson seemed to think the returned specimen was labelled the type and should be regarded as such, nevertheless the published locality should be considered as the type locality and the returned specimen as mislabelled.

There are before me 13 females from Wynward (February 1924) that are undoubtedly conspecific with Ricardo's Tasmanian specimen.

Tabanus vetustus, Walker.

Walker, 1848, 179; 1854, 250; White, 1915, 15; Ricardo, 1915, 277; Taylor, 1916, 762; 1918, 67; Ferguson, 1921*b*, 379.

This species was described from Western Australia, and probably the name has subsequently been applied to a complex, for I examined a mainland specimen some time ago and found it to differ from the Tasmanian form.

Though remarkably distinct in appearance, the species belongs to the *exulans*-group, agreeing in every respect, including the markings which may frequently be detected beneath the pulverulent yellow-brown that almost covers the insect. It occurs on the coastal sand dunes where it blends into its surroundings, becoming practically invisible when at rest. Females are often found inland, usually in open country. My specimens are all from the south-eastern coastal area of Tasmania.

Tabanus regisgeorgii group.

Eyes conspicuously diverging from the summit towards the antennae, hairy. Thorax with well-defined markings; four black stripes anteriorly and two or three posteriorly. Wings without markings, and the fourth radial vein with an appendix.

Two names come into this group, *diemanensis*, Ferguson, from Tasmania, and *regisgeorgii*, Macquart, a name that I suspect covers a complex of more than one form.

Tabanus gentilis group.

T. gentilis, Erichson, 1842, stands in a group of only one or two species, allied to the *gregarius*-group, but immediately distinguished by the median light thin stripe on the thorax. I have seen only Tasmanian specimens, but Ricardo described her *T. froggatti* as being a near ally.

Tabanus gregarius group.

Eyes hairy, conspicuously diverging towards antennae, dorsum of thorax marked as that on the *exulans*-group, fourth radial vein with an appendix.

Five Tasmanian species placed here form a nucleus of a group that hitherto has been recognised from the mainland by only two species. Besides *Tabanus*

sp., Ferguson & Henry (1920, p. 846), there is a specimen from Melbourne (8.iii.1918) that would appear to be the true *T. imperfectus*, Walker, 1848.

Before leaving Tasmania, the late Arthur White gave me a specimen of his *T. imperfectus*, and this has been invaluable in fixing definitely the identity of his species, but the type locality would indicate Walker's species is from the mainland. Ferguson's note attached by him to the pin on the Melbourne specimen states :—" very near *imperfectus*, but eyes (with) a shorter scantier pubescence." *T. tasmanicus*, Ferguson, 1921, *T. hobartensis*, White, 1915, and *T. neolatifrons*, Ferguson & Hill, 1922, together with the following species belong to this group.

Tabanus gregarius, Erichson.

T. gregarius, Erichson, 1842, 271; Walker, 1854, 252; White, 1915, 16; Ricardo, 1915, 275.
T. tasmaniensis, White, 1915, 8; Ferguson, 1921*a*, 28.

I think *T. gregarius*, Erichson, is conspecific with *T. tasmaniensis*, White, as the descriptions agree, and no other Tasmanian species conform to the same published characters. White states that he found the species occurred very scantily, but it is abundant at Cradle Mt. and in western Tasmania, these marshy areas being, perhaps, its normal habitat.

Tabanus basii, Ferguson.

Ferguson, 1921*a*, 22; 1921*b*, 378.

This species, from Victoria and Tasmania, is not typical of the Tasmanian element, and it will probably form one of a group otherwise confined to the mainland.

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FOUR NEW INDIAN CURCULIONIDAE (COL.)

By Sir Guy Marshall, C.M.G., D.Sc., F.R.S.

The following new species have all been bred and their larvae and pupae will shortly be described by Mr. J. C. M. Gardner, of the Forest Research Institute, Dehra Dun.

The types will be deposited in the British Museum and cotypes at Dehra Dun.

Subfamily Trachodinae.

Acienemis gardneri, sp. n.

♂. Derm testaceous brown (perhaps immature) with brownish-black scaling; rostrum with greyish-brown scales; elytra with a postmedian white band between striae 1 and 5 and a whitish patch on the lateral margin immediately above the hind coxae; underside with separated whitish scales, and a dense elongate patch on the mesepimera.

Rostrum with erect spatulate setae and dense scaling in the basal three-fourths which entirely conceals the sculpture. *Antennae* red-brown, the scape sparsely squamose on the club; the funicle with joint 1 very stout, 2 of about equal length but much more slender, 3–5 subequal and slightly longer than broad, 6 a little longer and broader, and 7 still longer; the club elongate, elliptical, with dense grey pubescence, narrowed and glabrous at the extreme base. *Prothorax* nearly as long as broad, gradually widening from near the base to well beyond the middle, the basal angles acute, abruptly constricted and subtubular at the apex, with the postocular lobes strongly developed and bearing a membrane-like fringe of scales; the dorsum convex longitudinally, closely set with very deep high-walled punctures, with a broad median sulcus which is shallow in the middle and very deep at the base, and a much shallower sulcus on each side of it; two tufts of erect scale-like setae at the apex and a transverse row of four similar tufts in front of the middle. *Scutellum* inconspicuous, bare, very small, narrow and immersed. *Elytra* much wider than the prothorax at the obliquely prominent shoulders, parallel-sided to beyond the middle, deeply constricted before the apex, which is subtruncate; the striae very broad and shallow, containing very large deep punctures (especially in the middle of the disk) which diminish rapidly behind; the intervals narrower than the striae, especially on the disk, where they become somewhat irregular, clothed with large flat overlapping scales; interval 1 with very broad scattered erect scale-like setae; 3 with a tuft of three similar setae near the base, another of five larger setae at about the middle, and isolated setae on the declivity; 5 with a tuft a little behind the basal one on 3, another before the middle, and a third behind the middle; 7 and 9 each with a row of smaller subrecumbent setae. *Legs* with the hind femora not exceeding the elytra, the basal half of the posterior pairs slender, that of the front pair thicker and separated from the clavate part by a dorsal impression; the tooth on the front femora very sharp and narrowly triangular, that on the posterior pairs small and spine-like; the tibiae slender, dark on the basal half and whitish apically, shallowly sinuate dorsally, bisinuate ventrally, without any apical mucro.

Length 3·8–4·0 mm.; breadth 1·4–1·5 mm.

Madras: Anamalai Hills, 2,400 ft., 2 ♂♂, 6.v.1930 (*J. C. M. Gardner*).

The sulcation of the pronotum is a very unusual character, and this combined with the small tooth on the hind femora and the very broad erect scale-like setae will serve to distinguish this species.

Subfamily Zygopinae.

Metialma anisomelis, sp. n.

♂♀. Derm red-brown, with a variegated pattern of light and dark brown, white and pink scaling; the base of the rostrum white, with a pink patch; the prothorax with a large subcircular cinnamon-brown patch in the middle of the basal half having a few white scales on its lateral margins and including a short white stripe in the middle of the base which extends on to the scutellum, the brown patch surrounded anteriorly by a dark brown semicircular band, a round dark brown spot on each side at the middle, a small pink patch in each posterior angle, and the anterior half and sides light brown with a reticulate pattern of white lines; the elytra variegated with light brown, grey and dark brown markings, and with a large common ovate grey patch (more or less tinged with pink) extending from the scutellum to two-thirds of the length and laterally to stria 2, followed by a small subquadrate blackish sutural patch, and immediately behind a similar apical patch of grey tinged with orange; the mesosternum mainly pink, with mingled white scales in the middle and an irregular blackish patch on the epimera; the metasternum white with a quadrate blackish patch on the anterior third of the episterna; the venter white, with a large quadrate median dark patch on ventrites 3 and 4 and a small white spot in the middle of each.

Rostrum red-brown, with the apical half paler; in the basal half a strong median carina and two indistinct, one on each side. *Antennae* testaceous. *Prothorax* with a high conical median elevation, shallowly constricted and subtubulate at the apex; both the white and brown scales along the median line from the base to the top of the central elevation rather broader and much denser than the adjoining discal scales, and the white scales on the anterior half broader than the brown ones. *Elytra* very wide at the shoulders and rapidly narrowing behind, with a broad transverse basal depression and a shallower sublateral one behind the shoulders, the suture broadly impressed to behind the middle; the large paler sutural patch formed entirely of narrow oblique scales. *Legs:* front femora with mingled light brown and white scales, middle and hind femora white in the basal half and pale brown apically with two obliquely placed white spots.

Length 3·7–3·9 mm.; breadth 2·0–2·3 mm.

United Provinces: Dehra Dun, 4 ♂♂, 1 ♀, bred from stems of *Anisomeles ornata*, 30.viii.1933 (*J. C. M. Gardner*).

Nearly allied to *M. versicolor*, Fst. 1898, which also has a median elevation on the pronotum but has no common pale patch on the elytra, the elytral impressions are much shallower or obsolescent and the shoulders are less prominent, the prothorax is less widened at the base and the external angles less acute, and the basal patch of white scales is much larger.

M. balsaminae, Mot. 1863, differs *inter alia* in having no central prominence on the pronotum, whereas on the elytra there is a postscutellar patch of broad white scales.

Osphilia bombacis, sp. n.

♂♀. Very closely allied to *O. vitis*, Mshl. (1928, *Ann. Mag. Nat. Hist.* (10) **2**: 549), the description of which applies to it except as regards the characters given in the following key to the four known Indian species of the genus.

Length 3·3–3·6 mm.; breadth 1·5–1·6 mm.

United Provinces: Suswa R., Dehra Dun, 5 ♂♂, 1 ♀, bred from *Bombax malabaricum*, iv.–vi.1931 (*Dr. C. F. C. Beeson*—type); Lalkua, Chakata, Haldwani, 1 ♂, 1 ♀, bred from same host, v.1931 (*S. N. Chatterjee*).

Key to Indian Species of Osphilia.

1(2). Tooth of front femora spine-like, followed by a smaller tooth (♂) or angulation (♀); distal joints of funicle longer than broad . *odinae*, Mshl.

2(1). Tooth of front femora broadly triangular, without an additional tooth; distal joints of funicle transverse.

3(6). Lower margin of eyes sinuate anteriorly; pronotum with yellowish scales; the two lateral intervals on elytra with patches of dark and pale scales; metasternum with narrow separated scales in the middle showing the derm.

4(5). Antennae with the two basal joints of the funicle equal, club concolorous with funicle; elytra with only a few pubescent scales at base of interval 2, the subapical dark sutural patch as long as the pale apical patch *vitis*, Mshl.

5(4). Antennae with joint 2 of funicle longer than 1, club darker than funicle; elytra with a row of whitish pubescent scales to beyond middle on interval 2, the subapical dark sutural patch shorter than the pale apical patch . . . . . *gmelinae*, Mshl.

6(3). Lower margin of eyes straight; pronotum with greyish-white scales; the two lateral intervals on elytra with pale scales only; metasternum with dense overlapping scales in the middle concealing the derm; club of antennae infuscated . . . . . *bombacis*, sp. n.

Subfamily Ceuthorrhynchinae.

Mecysmoderes stylicornis, sp. n.

♂♀. Derm dull black; the head with a few pinkish-brown scales between the eyes; the prothorax with sparse small narrow grey scales above, the entire sides and lower surface with dense pinkish-brown scaling and an isolated spot of the same colour on each side behind the middle; the elytra with a stripe of dense scaling on the basal half of interval 1, the stripe velvet-black in its basal two-thirds and becoming orange behind and then grey, a large pinkish patch in front of the shoulder, and scattered grey scales in the striae; the sternum with dense pinkish-brown scales, turning to whitish in the middle; the venter whitish, more or less tinged with yellow. In some specimens all the pinkish-brown markings may become whitish.

Head coarsely and closely punctate, with a fine carina on the vertex; the forehead very deeply depressed, very broad behind and narrowing in front to the width of the rostrum. *Rostrum* extremely long and slender, cylindrical and moderately curved, about as thick as the front tibiae, two-thirds the length of the body in ♂, six-sevenths in ♀, 5-carinate for three-fourths the length in ♂ and for half the length in ♀; the scrobes uniting beneath at some distance from the base but curving sharply upwards just in front of the eye to accommodate the apical process on the antennal scape. *Antennae* testaceous, becoming fuscous towards the apex, inserted behind the middle in both sexes; the scape with a narrow lanceolate laminar process at its apex, curved and concave anteriorly, and with two black setae adjoining it; the funicle with joint 2 longer than 1, 3 much longer than 2, 4 and 5 subequal and longer than broad, 6 a little shorter and broader. *Prothorax* with the sides shallowly sinuate in the apical half (as seen from above), the anterior part of the dorsum being strongly compressed laterally; the apical margin slightly angulate in the middle, the basal spine about one-third the length of the suture; the dorsum convex longitudinally, with coarse reticulate punctures forming irregular longitudinal ridges and a shallow median impression containing a strong complete carina. *Elytra* somewhat broader than long, subcordate, broadly rounded at the prominent shoulders, shallowly impressed transversely near the base, the basal margin being strongly elevated; the striae broad and deep, with deep punctures containing scattered grey scales; the intervals somewhat broader than the striae,

set with numerous small shiny granules, the alternate intervals more raised. *Legs* rugosely punctate, black, with the tarsi piceous; the femora with the basal half clothed with dense broad pinkish or whitish scales, the rest with sparse narrow blackish and white scales, the femoral tooth large; the dorsal apical fringe of the hind tibiae longer than the first tarsal joint. *Sternum* with the space between the front coxae as wide as the rostrum; the mesosternum very steep, with a large round median impression; the metasternum simple.

Length 3·5–4·0 mm.; breadth 2·4–2·6 mm.

United Provinces: Dehra Dun, 2 ♂♂, 2 ♀♀, bred from *Costos speciosa*, viii.1933 (*B. S. Gusain*—type). Burma: Rangoon, 1 ♂, 1885 (*C. T. Bingham*).

This is much the largest species of the genus known to me, and apart from its size and characteristic coloration it should be readily recognisable by the remarkable process at the apex of the scape, which is two-thirds the length of the first funicular joint. Motchulsky has described a large species (*semialbidus*) from India (1866, *Bull. Soc. Nat. Moscou*, **39**, 2 : 442) the inadequate colour description of which might fit the present species, except that he describes the post-scutellar patch as white.

A REMARKABLE NEW GENUS OF THE FAMILY PERISCELIDAE (DIPT.)

By John R. Malloch.

About a year ago my friend, Mr. R. C. Shannon, turned over to me some Diptera that he had collected at Iquitos, Peru, and amongst them is a very remarkable species which I describe below. Dr. J. M. Aldrich of the United States National Museum found three additional specimens of the species in that Institution that had been presented by Mr. Shannon and has added them to the set now in hand.

Schizochaeta, gen. n.

Generic characters: Unique in the family, or for that matter in the Acalyptratae, in having the antennal arista bipartite, the main stem branching into two near the base of its upperside, and both branches having long rays (fig. 1); the second antennal segment is also peculiar, having a long projection on its lower apical angle which is armed with a bristle; the head of the male is wider than that of the female, but the general structure is the same in both (fig. 2); vertex sharp, with four long bristles, the postverticals lacking; ocellars lacking, but a pair of long reclinate bristles on centre of the interfrontalia well in front of anterior ocellus may represent these much displaced; each orbit with two long bristles, the upper one reclinate, the lower one very close to upper, slightly laterad of it and incurved; frons wider than long, the surface with some short fine hairs; face flat in centre, with a shallow fovea below each antenna which is terminated below by a slight ridge below each of which there is a strong incurved bristle, and below these and nearer centre of face another pair of shorter straight bristles, laterad of these and near eye there are about three weaker bristles; eyes, much higher than long, bare; antennae as in fig. 1; palpi well developed; proboscis stout. Thorax with no humeral, two notopleurals, the posterior one on an elevation, two pairs of strong widely separated postsutural dorsocentrals, one short supra-alar, one small postalar, two strong scutellars, two sternopleurals, no propleural, and some fine hind-marginal bristles on the mesopleura. Abdomen tapered, hypopygium small, with several pointed processes. Subcostal vein incomplete, ending about two-thirds of the way to costa (fig. 4).

Genotype, the following species.

Schizochaeta shannoni, sp. n.

Shining black, with lower part of face, part of antennae, and of legs honey-yellow, the wings brownish-hyaline, and the halteres yellow.

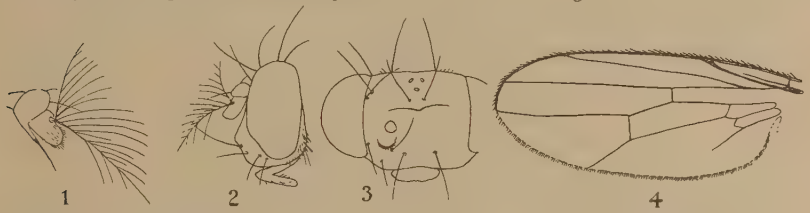
♂. Length, 3·5–4 mm.

Head shining black, the facial foveae metallic dark blue, the centre of face with a broad whitish to yellowish dusted vitta that extends from antennal insertions to epistome, the latter with a yellow patch in centre that extends upward to near the bases of the upper pair of bristles, and another on each side extending along the genae; antennae black, the apical process of second segment and base of third honey-yellow; palpi black. Profile as fig. 2, front view as fig. 3.

Thorax shining black, mesonotum microscopically shagreened, the disc between the dorsocentrals more or less evidently yellowish; humeri with a yellowish mark. Mesonotum with a few very short fine scattered hairs besides the long bristles; scutellum more distinctly shining than mesonotum, and not shagreened.

Legs honey-yellow, all femora blackened apically, the fore pair most extensively, the hind pair least extensively so; all tibiae blackish-brown, apices of mid pair yellowish; tarsi with the apical two segments of fore and mid and the apical one of hind pair blackened. Fore femur with a long preapical posteroventral bristle, all tibiae with the preapical dorsal bristle present, stronger on the mid pair, and the latter with a single apical ventral spur that is longer than usual.

Wings of average size, brownish-hyaline, the venation as in fig. 4.



Figs. 1–4, *Schizochaeta shannoni*, sp. n.—fig. 1, antenna of male; fig. 2, head in profile; fig. 3, head from in front, left side incomplete; fig. 4, wing.

Abdomen shining black, more brownish basally.

Knobs of halteres yellow.

♀. Differs from the male in having the head hardly wider than the thorax, the face without distinct central dusting and entirely dark, and the antennae black.

Holotype ♂, allotype, and paratypes, Peru: Iquitos, Mar.–Apr., 1931 (*R. C. Shannon*).

This species is named in honour of the collector who has placed at my disposal this and a number of other interesting species from South America.

This genus will fall in my Caption 2 of the recently published key to the genera of this group * as it lacks a forward curvature of the subcostal vein, but it may be at once separated from any of those included therein by the divided antennal arista. The eyes are not stalked nor haired as in *Diopsosoma*, Malloch, and the epistome is retreating, which latter character separates it from the other three genera in this section.

This brings the number of genera known to me to seven, but I have seen another which is as yet undescribed, and believe that from the same region that produced the one described above there will yet be brought many more, though I sincerely hope they will not be all monobasic.

A paratype will be sent to the British Museum.

* 1932, *Stylops*, **1**: 266.

TWO NEW GENERA OF APHIDIDAE (HEMIPTERA)

By Ryoichi Takahashi.

(*Department of Agriculture, Research Institute, Formosa.*)

Anomalosiphum, gen. n.

Winged viviparous ♀. Body with some simple setae. Head not divided by a median suture, lacking frontal tubercles. Eyes with ocular tubercles eminently protruding. Antennae somewhat shorter than the body, 5-jointed; the distal part of the last joint shorter than the base. Mesonotum divided into lobes. Fore-wings with the 3rd oblique (media) once branched; stigma not elongate; hind-wings narrow, but not considerably reduced, with hooklets at some distance from the tip and only one oblique (media). Abdomen lacking discernible lateral tubercles, but with a pair of dorsal tubercles on the 8th segment. Cornicles large, much longer than wide, somewhat swollen, with a few simple bristles. Caudal segment large, nearly triangular, setose. Anal plate rounded, short, setose. Legs normal.

Genotype.—*Anomalosiphum pithecolobii*, sp. n.

This genus apparently belongs to the subfamily Greenideinae and is no doubt closely related to *Brasilaphis*, Mordvilko (*C.R. Acad. Sci. U.R.S.S.*, **1930** : 277), but differs from it in the hind-wings not being considerably reduced in size, with the hooklets at some distance from the tip, and in the caudal segment being nearly triangular. It is very remarkable that this aphis found in Formosa is related to *Brasilaphis* known only from South America, and it is probable that some related Aphids exist in other countries in the Oriental Region.

Anomalosiphum pithecolobii, sp. n.

Winged viviparous ♀. Greenish-yellow. Eyes red. Antennae black. Mesothorax brownish-yellow. Cornicles pale, dusky on the distal half. Cauda pale. Wings hyaline; veins blackish-brown; stigma mostly pale yellowish, broadly blackish-brown on the hind marginal area. Legs pale yellow, slightly dusky on the apices of tibiae and on the tarsi. Body rather stout, with no lateral tubercles discernible. Head nearly straight on the front margin, not divided, with 5 pairs of short simple setae on the dorsum, of which 2 pairs are between the antennae. Frontal tubercles absent. Eyes large, with ocular tubercles eminently protruding. Antennae slender, 5-jointed, with a few very small setae very slightly capitate; the 2nd joint somewhat smaller than the 1st, slightly longer than wide, a little imbricated; the 3rd sometimes slightly curved, stouter than the tibia, scarcely imbricated; with about 33–40 rather large transversely narrowed sensoria scattered over the whole length; the 4th a little imbricated, narrowed on the base, with about 8–11 similar sensoria nearly in a row on the whole length, the primary sensorium circular, rather large, near the tip; the 5th imbricated, without secondary sensoria; the secondary sensoria on the 3rd and 4th joints a little protruding, occupying nearly half the circumference of joints; the relative length of joints about as follows: III—90, IV—50, V—25 + 13. Rostrum slender, reaching the hind coxae, pointed at the tip. Mesonotum divided into lobes. Abdomen with a few short setae, and with a pair of rather small tubercles on the 8th tergite, which are expanded on the base, slightly constricted near the tip, much longer than wide, striate, rounded apically and with a very long stout bristle at the tip, the bristle longer than the tubercle itself; some hairs on the hind part of abdomen longer than those on the anterior part. Cornicles stout, a little swollen, constricted on the distal part, about 4 times as long as wide, distinctly striate on the distal part, not imbricated, shorter than the 4th antennal joint, with a flange at the tip and some 5 long simple bristles on the distal

part. Caudal segment or the last tergite large, nearly triangular, much wider than long, produced into a short process at the hind end, more or less pointed apically, setose, with 3 pairs of long stout curved setae, of which the anterior pair is much shorter. Anal plate short, broadly rounded, setose, with some very long stout bristles. Fore-wings normal in

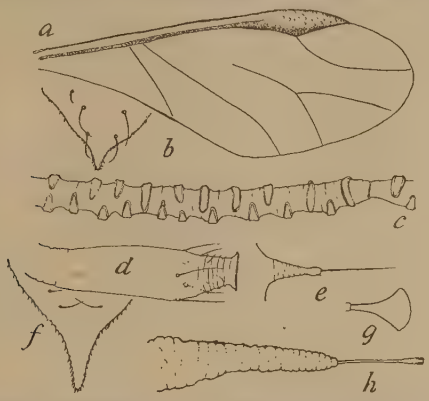


FIG. 1.—*Anomalosiphum pithecolobii*, sp. n. Winged viviparous ♀. Adult.—*a*, fore-wing; *b*, caudal segment; *c*, sensoria on antenna; *d*, cornicle; *e*, dorsal tubercle on 8th abdominal segment. Grown nymph.—*f*, caudal segment; *g*, fan-like seta on body; *h*, dorsal tubercle on 8th abdominal segment.

shape, a little imbricated on the marginal area of the distal half; subcosta with about 4 small pores; stigma not elongate, rather stout, imbricated, pointed apically; veins rather stout; the 1st oblique (anal) nearly straight; the 2nd (cubitus) a little curved on the distal part; the 3rd (media) once branched, obsolete on the basal part; stigmatic vein moderately curved. Hind-wings narrow, a little imbricated, with only one oblique (media) which is obsolete on the distal part; hooklets 2, far distant from the tip of the wing. Legs long, slender; femora not swollen, as wide as the cornicle, with a few short setae; tibiae not striate, with many short setae; tarsi a little imbricated, the basal joint with 2 long bristles; hind tarsi longer than the distal part of the last antennal joint.

Length of body—about 1·15 mm., antenna—about 0·9 mm., cornicle—about 0·16 mm., hind tibia—about 0·5 mm., dorsal tubercle on 8th abdominal segment—about 0·047 mm., fore-wing—about 1·7 mm., hind-wing—about 0·854 mm. Width of hind-wing—about 0·231 mm., width of abdomen—about 0·48 mm.

Grown nymph of winged viviparous ♀. Yellow. Body with many small mosaic-like markings on the dorsum, and short setae which are flattened and distinctly expanded distally. Head fused with the pronotum, with 4 longer setae in a transverse row on the front. Antennae imbricated, 4-jointed; the 3rd joint very long, slightly curved; the relative length of joints about as follows: III—86, IV—25 + 13. Abdomen with 2 pairs of very long projections on the dorsum behind the cornicles; the projections large, slender, but expanded towards the base, slightly curved, roughly imbricated, with a long stout capitate apical seta shorter than the projection itself; posterior projections larger, as long as the cornicle. Cornicles nearly as in the adult in shape, with about 5 long setae which are expanded apically. Caudal segment large, produced into a distinct process at the hind end, pointed apically, very slightly wider than long, setose, with 3 median pairs of long stout curved bristles directed mesad, the anterior pair much shorter. Anal plate distinctly indented at the middle, with some very long bristles on the hind margin. Femora and tibiae with some normal simple and fan-like setae.

Length of body—about 1·0 mm., antenna—about 0·62 mm., posterior dorsal tubercle on abdomen—about 0·16 mm., hind tibia—about 0·37 mm., frontal fan-like seta—about 0·026 mm. Width of caudal segment—about 0·014 mm.

Host.—*Pithecolobium lucidum* (Leguminosae), attacking young leaf and shoot.

Formosa: Shinten near Taihoku; four adult females and a few nymphs were taken by the author on 12 and 20 May, 1933.

Taiwanaphis, gen. n.

Winged viviparous ♀. Body without wax-pores, capitate setae and long hairs. Head not divided, lacking frontal tubercles. Eyes normal. Antennae 6-jointed, with no eminent setae; the 1st joint not elongate, not protuberant on the mesal side, but with a short obtuse tubercle on the lateral side; sensoria transversely oval; distal part of the last joint shorter than the base. Fore-wings with the 3rd oblique (media) twice branched; hind-wings with 2 obliques (media and cubitus). Abdomen without conspicuous tubercles. Cornicles short, wider than long, expanded towards the base, a little constricted on the apical part, with a flange at the tip. Cauda elongate, distinctly constricted, the distal part nearly triangular when seen from above. Anal plate deeply bilobed, short. Legs normal.

Wingless viviparous ♀. Oval, without dorsal and lateral tubercles. Head fused with the pronotum. Eyes not protruding, with ocular tubercles distinct. Antennae very short, much shorter than the body, 4-jointed, without secondary sensoria. Other characters as in the winged form.

Genotype.—*Taiwanaphis decaspermi*, sp. n.

This genus seems to be related to *Agrioaphis*, Walk. (syn. *Myzocallis*, Pass.), but differs in the shape of the cauda, as well as in the cornicles with a flange. In this genus the apterous viviparous female with short 4-jointed antennae is commonly produced, in this respect also differing from *Agrioaphis*.

This aphis also resembles *Cepegilletia*, Granov., *Shivaphis*, Das, and *Neophyllaphis*, Takah., in the shape of the cauda, but differs considerably from them.

Taiwanaphis decaspermi, sp. n.

Winged viviparous ♀. Brownish-black. Head and thorax black. Antennae dusky. Wings broadly clouded along the veins. Cornicles and cauda black. Body oblong, not provided with wax, with some very short setae. Head with a broad, but very short, protuberance on the front, below which the front ocellus is located. Frontal tubercles almost absent. A curved narrow thickening of skin discernible behind each dorsal ocellus. Eyes normal. Antennae slender, imbricated, 6-jointed, with no distinct setae; the 1st joint as long as wide, with a small blunt tubercle on the lateral side; the 3rd as stout as the front tibiae, somewhat narrower on the distal part, with about 11–14 small and rather large sensoria on the whole length, which are transversely oval and are not arranged in a row, the larger ones not occupying half the circumference of the joint; the 4th without sensoria; the 5th a little expanded distally, with the usual sensorium small and oval; the 6th rounded at the tip; the relative length of joints about as follows: III—78, IV—34, V—29, VI—27 + 15. Rostrum nearly reaching the middle coxae, obtuse at the apex. Abdomen faintly reticulated on the dorsum, with 3 very short obtuse wide lateral tubercles in front of each cornicle, which are inconspicuous, shorter than the cornicle, and with many minute spinules and 1 or 2 short setae. Cornicles much wider than long, short, expanded towards the base, a little constricted on the apical part, striate, with a short seta near the base and a flange at the tip. Cauda elongate, distinctly constricted, the distal part triangular,

tapering, much longer than wide, rounded at the apex, with about 11 long bristles. Anal plate short, distinctly bilobed, but the lobes not far separated, rounded, setose, each lobe as wide as the cauda, much wider than long, with about 5 long bristles. Wings somewhat imbricated; veins stout; the 1st and 2nd obliques on the front wings slightly curved; the 3rd twice branched, the upper branch reaching the tip of wing; stigmatic vein more slender than other veins, moderately curved; stigma short, truncate on the distal end, well imbricated, with no setae; subcosta with 1–4 small circular pores on the distal part; hind-wings small, with 2 divergent obliques and 3 hooklets. Legs slender, with many short setae; basal tarsal joint with 3 setae; hind tarsi much shorter than the 5th antennal joint.

Length of body—about 1·6 mm., antenna—about 1·0 mm., fore-wing—about 2·5 mm., hind-wing—about 1·3 mm., hind tibia—about 0·55 mm., knobbed part of cauda—about 0·092 mm. Width of knobbed part of cauda—about 0·065 mm.

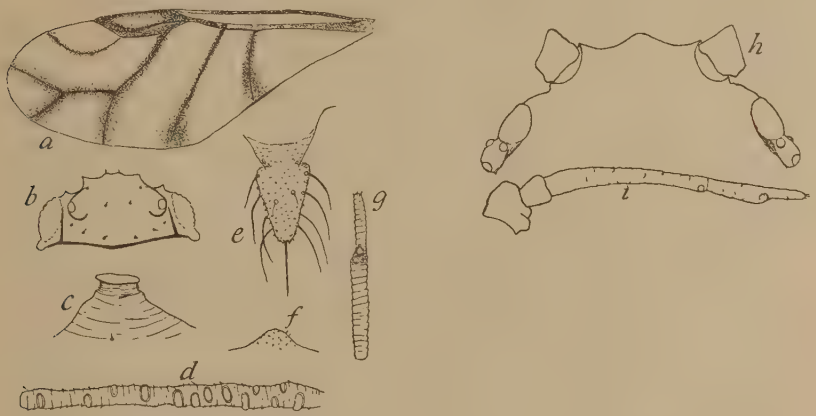


Fig. 2.—*Taiwanaphis decaspermi*, sp. n. Winged viviparous ♀.—*a*, fore-wing; *b*, head; *c*, cornicle; *d*, 3rd antennal joint; *e*, cauda; *f*, lateral abdominal tubercle; *g*, 6th antennal joint. Wingless viviparous ♀.—*h*, head; *i*, antenna.

Wingless viviparous ♀. Nearly black. Antennae, cornicles and legs black. Cauda dusky. Body oval, broadest at the basal part of abdomen, a little chitinised and with fine corrugations over the dorsum, with no setae discernible. Head short, a little protruding at the middle of front, fused with the pronotum. Eyes rather small, not protruding, with large ocular tubercles. Frontal tubercles absent. Antennae imbricated, very short, as long as the width of head including the eyes, 4-jointed, with a few small setae; the 1st joint a little wider than long, a little protruding obtusely on the lateral side, the mesal side longer than the lateral side; the 2nd smaller, a little wider than long; the 3rd long, much longer than the front tibia, a little narrowed near the distal end, lacking secondary sensoria, sometimes with 1 or 2 faint traces of division, the sensorium rather small, circular or oval; the 4th not well defined from the 3rd; the relative length of joints about as follows: III—50, IV—14 + 8. Rostrum rather stout, reaching beyond the middle coxae. Dorsal and lateral tubercles absent. Cornicles very short, small, nearly similar in shape to those of the winged form, but much shorter. Cauda and anal plate as in the winged form. Legs rather short, with some short setae; tibiae stouter than the 3rd antennal joint; hind tibiae narrowed about the middle; hind tarsi shorter than the last antennal joint.

Length of body—about 1·2 mm., antenna—about 0·37 mm., hind tibia—about 0·254 mm., cauda—about 0·106 mm.

Host.—*Decaspermum fruticosum* (Myrtaceae), attacking the lower side of the young leaves and the shoots.

Formosa (Taiwan): Taihoku and Suisha, many specimens were collected by the author in January and June, 1933.

The type specimens are preserved in the collection of the Department of Agriculture, Research Institute, Formosa.

DREI NEUE PHLOEOTHRIPIDEN (THYSANOPTERA)

Von Dr. H. Priesner.

Bolothrips marshalli, sp. n.

♂: Schwarzbraun, die Endsegmente des Abdomens am dunkelsten, Vorderschenkel schwarzbraun, am Ende, besonders innen, braungelb bis gelb, Vordertibien gelb, am Innen- und Aussenrand breit graubraun, Vordertarsen gelb, Mittel- und Hinterschenkel und Schienen dunkel, die Trochanteren und der apikale Innenrand der Schenkel gelblich aufgehellt, Mittel- und Hintertarsen graugelb, also deutlich getrübt. Fühler von der Farbe des Kopfes, nur das 3. Glied in der Basalhälfte hellgelb, in der Endhälfte dunkel oder die Trübung ist noch weiter gegen die Basis ausgedehnt und unregelmässig wolkig. Vorderflügel der ganzen Länge nach deutlich rauchig getrübt, eine dunkle Mittelängslinie wenig deutlich, Borstenplatte dunkler; Hinterflügel schwächer getrübt. Kopf- und Prothoraxborsten stark getrübt, auch die Analborsten, die übrigen Abdominalborsten schwächer getrübt. Rotes Pigment im Körper vorhanden.

Kopf 277, von den Augen ab 253 μ lang, in der Mitte der Seiten 225 μ breit; Augen lateral 80–84 μ lang, die Wangen hinter denselben 208 μ; die Ocellen bilden ein sehr stumpfwinkeliges Dreieck, die hinteren stehen etwas vor der Mitte der Netzaugen; Kopfgipfel fehlt; Postocularborsten lang, vielleicht 108 μ, am Ende hell, nicht ganz scharf, dicht hinter den Augen eingelenkt, von diesen nur etwa 12–16 μ entfernt, von einander sehr weit, 155 μ, abstehend. Mundkegel kurz, *sehr breit abgerundet.* Fühler etwa 500 μ lang; Gliederlängen(-breiten): 40 (B. 52, Sp. 39), 64 (36), 88–92 (34), 88 (36), 80 (35), 68 (30), 46 (24), 32 (15) μ. Das 1. Glied an der Basis viel breiter als am Ende, das 2. am Grunde geschnürt, in den beiden Enddritteln parallelseitig, die Areola zwischen Mitte und Spitze, das 3. Glied mit zwei mässig langen Sinneskegeln, von denen der innere ziemlich weit unten steht, das 4. mit 4, das 5. mit $1 + 1^{+1}$, das 6. mit 1 grossen, dorsalen und 1 kleinen, seitlichen, äusseren, das 7. mit 1 dorsalen. Das 8. Glied vom 7. zwar getrennt, aber am Grunde nicht geschnürt, sondern breit ansitzend, das 5., 6. und 7. am Grunde geschnürt. Prothorax sehr kurz und stark quer, 120–132 μ lang, ohne Coxen 363 μ, Vorderrand tiefbogig eingebuchtet, eine vollständige, dunkle, endothorakale Leiste ist ausgebildet; die Borsten an den Vorderecken mässig entwickelt, ziemlich nach innen gerückt, 52–56 μ lang, die lateralen 64, die inneren Hinterrandborsten 88–92, die äusseren länger, 132–136 μ lang, spitzig. Vorderschenkel stark verdickt, am Innenrande fast gerade, ihre Dicke bei der Type 150 μ. Vordertibien an der Basis stark gekrümmt, am Ende innen einfach, Vordertarsenzahn gerade, kräftig, gelb. Pterothorax seitlich ganz schwach gleichmässig gerundet, Breite 460 μ. Flügel etwa 0·986 mm. lang, gleichbreit, deutlich etwas gebogen, mit 10–13 Schaltwimpern. Die Flügelbasalborsten 48, 80–84 und etwa 140 μ lang, die beiden

ersteren gerade, dunkel, mit heller Spitze, die 3. am Grunde gebogen. Borsten am Abdomen lang, normal, die des 9. Segmentes spitzig, B. 3 etwa 208–212 μ lang, gelblich. Das 9. Sternit über die Tubusbasis stark vorgezogen. Tubus dick, an den Seiten etwas konvex, mit wenigen, ganz feinen Körnchen an den Seiten, Länge 242 μ, Breite an der Basis etwa 130, an der Spitze nur 52 μ. Terminalborsten etwa 180 μ lang.—Körperlänge (gedehnt): 2·51 mm.

♀: Färbung fast wie beim ♂, nur die Vordertibien in der Mittellinie weniger licht, das Ende der Vorderschenkel weniger auffallend aufgehellt, und die Vordertarsen graulichgelb. Vorderschenkel einfach, Vordertibien kaum gekrümmt, Vordertarsen ohne Zahn. Schaltwimpern wie beim ♂. Der Darm enthält zwei verschiedene Arten Pilzsporen.

Masse der Type in μ; Kopf 277, von den Augen an 253 lang, an den Wangen 246–248 breit, Augenlänge 84, Schläfen hinter den Augen 208, Postocularborsten 100, Fühler, 485; Fühlergliederlängen(-breiten): 40 (B. 52, Sp. 38), 68 (36), 92 (36), 80 (38), 78 (36), 70 (32), 44 (24), 32 (16). Vorderschenkeldicke 113. Prothoraxlänge 124–128, Breite ohne Coxen 372, mit Coxen 415. Mesothoraxbreite 450. Flügellänge 1038. Borsten am 9. Segment 218–220. Tubuslänge 250, Tubusbreite an der Basis 130, am Ende 52.—Körperlänge (gedehnt): 2·59 mm.

Larve. II. Stadium: Körper dicht mit roten, polygonalen Pigmentzellen erfüllt, im Kopf sind sie spärlich, in den Beinen fehlen sie. Graubraun sind: Kopf- und Pronotumplatten, Beine, 1., oft auch das 2. Fühlerglied, die Borstenplättchen; die Basis der Schenkel etwas dunkler als die Endhälfte; schwärzlich sind: Das 2. oder 3. bis 7. Fühlerglied, die vollständigen Seitenplatten am 8. und das ganze 9. und 10. Segment des Abdomens, ferner das lange Analborstenpaar.

Fühlergrubendistanz gross, 40 μ, Kopf an den Augen 160–165 μ breit, dorsale Länge der Kopfplatten 162 μ; Inneraugenborste gut entwickelt, 60–64 μ, geknöpft oder abgerundet, wie die übrigen dorsalen Kopfborsten, B. 1 der 2. Reihe ebenso lang, hinter den ersteren gelegen, B. 2 derselben Reihe 42 μ, hinter den Augen, aber etwas weiter nach vorn gerückt als B. 1, B. 3 sehr klein, 12 μ, spitzig. Am Kopf ist ein Zentralplättchen abgesondert. Fühlerlänge 337–346 μ; Gliederlängen(-breiten): 28 (B. 44, Sp. 32), 46–48 (30), 92–100 (B. 23, Sp. 28), 56 (32), 46 (27), 72 (6. Gl. 20, 7. Gl. 14) μ. Sinneskegel am 4. Glied gebogen, 22 μ, das 3. Glied an der Basis stark erweitert wie für *Bolothrips* charakteristisch, das 7. und 8. Glied ohne Naht verschmolzen. Das Borstenpaar oben am 2. Segment ist nicht geknöpft. Borsten 1–5 am Pronotum sind am Ende plötzlich hell, aber nicht geknöpft; B. 1 klein, 22 μ, B. 2 nicht länger, B. 3: 48 μ, B. 5: 32 μ, B. 6 sehr lang, haarartig, 180 μ, B. 7 sehr klein, 13 μ. Pronotumplatten 130–140 μ lang. Basalplättchen am Mesonotum 48–56 μ breit, B. 6 des Mesonotums 60, des Metanotums 72 μ lang; B. 1 des 1. Abdominalsegmentes 54 μ, B. 2: 32 μ; B. 1, 2 des 7. Segmentes 40–44, B. 3 etwa 160 μ lang; B. 1, 2 des 8. Segmentes 48 μ, B. 1–3 des 9. Segmentes haarartig, 220–240 μ, B. 2a etwa 40 μ lang, alle spitzig. Das 9. Segment hat eine Länge von 120 μ, bei einer Grundbreite von 132 und einer Breite an der Borstenbasis, von 108 μ; 10. Segment 116–120 μ lang, am Grunde 88, am Ende 38 μ breit. Das 2. ventrale Paar Terminalborsten misst 0·5 mm., die übrigen sind kurz, B. 1 etwa nur 80 μ, die ventralen Lanzettborsten 72 μ. Darm mit Pilzsporen erfüllt.

I. Stadium: Hier schliessen die roten Pigmentzellen nicht so dicht aneinander und sind viel kleiner. Die stark chitinisierten Teile des Körpers sind grau, das 5.–7. Fühlerglied deutlich dunkler als die vier basalen Glieder.

Kopfbreite an den Augen 112 μ, Interantennalabstand 20 μ. B. 1 der ersten Reihe am längsten von allen (Inneraugenborste), eine zweite der 1. Reihe gerade zwischen zwei Teilaugen gelegen. Diese Borsten sind etwas getrübt. Fühlerlänge 244–248 μ. Gliederlängen(-breiten): 24 (32–34), 38 (28), 44 (32), 36 (32), 32 (28), 68 (22). 6. und 7. Glied vollkommen miteinander verschmolzen; Sinneskegel am 4. Glied lang, 26 μ, das 3. Glied 1·4 mal so lang als breit. B. 1 und 2. des Pronotums rudimentär, B. 3 mässig lang, B. 4:

28 μ, dunkel, wie B. 3, B. 5 viel kleiner als 4, B. 6 sehr lang, etwa 145 μ, haarartig; B. 3 am Meso- und Metanotum 48–60 μ, dunkel, fast spitzig. B. 1 des 1. Segmentes des Abdomens 28 μ, die lange Lateralborste des 7. Segmentes misst 200 μ, spitzig; B. 1, 2 des 8. Segmentes 30 und 24 μ; Borsten am 9. Segment sehr lang und fein, haarartig, 260 μ, das 9. Segment *ganz chitinisiert*, 44 μ lang, am Grunde etwa 88, am Ende 76 μ breit; das 10. Segment misst 76–80 μ in der Länge. Das lange Terminalborstenpaar dunkel, 468 μ.

Diese Larven sind typische *Bolothrips*-Larven, die im II. Stadium dem *Bolothrips dentipes*, Reut., am nächsten kommen, sich aber durch das längere und schlankere Fühlerendglied (7. Glied), das kürzere 2. Glied im Verhältnis zum 3. (44–48 : 100; bei *dentipes* 56–60 : 100) und das kürzere, lateral nicht konkave 9. Segment des Abdomens unterscheiden; auch ist der Interantennalabstand schmäler und der Kopf kleiner als bei *dentipes*.

Als Imago ist die neue Art von ?*Cryptothrips corvus*, Pr., durch das viel kürzere, am Grunde nicht geschnürte 8. Fühlerglied und die breitere Form des Tubus, von *B. gilvipes*, Hood, durch die dunkleren Mittel- und Hinterbeine, von *B. collaris*, Bagn., durch die Kopfform und die Färbung der Fühler, von *B. badius*, Hood, durch den Besitz der Flügel und den viel weniger gestreckten Kopf, von *Cryptothrips insularis*, Bagn., durch die Fühlerbildung und die Färbung verschieden. Von den europäischen Arten sind *B. bicolor*, Heeg., und *B. cingulatus*, Karny, auffallend zweifarbig, *B. dentipes*, Reut., hat nach hinten stark vorgezogene Augen und ganz verschiedene Kopfform, während *B. icarus*, Uz., nicht-gekörnten Tubus und an der Basis deutlich geschnürtes 8. Fühlerglied besitzt; *B. brachyurus*, Bagn., ist flügellos und anders gefärbt, hat weniger gestreckten Kopf und kürzeres Pronotum. *Gynaikothrips yuasai*, Moult., der vielleicht auch zu *Bolothrips* gehört, ist schon durch die Tubusform leicht zu unterscheiden.

Fundort: Sierra Leone: Njala.—Die Typen und die Larven (mit Vorpuppe und Puppe II.) wurden von *E. Hargreaves* in *Cassava*-Früchten gefunden, 4.xi.1932; zwei Exemplare wurden ferner am selben Fundorte, am 14.ix.32, in Gallerieen eines Bohrinsektes in *Bauhinia* sp. (No. 520) angetroffen; ein einzelnes (im Alkohol verblasstes) ♂ fand Hargreaves in Njala zusammen mit *Elaphrothrips decipiens*, Pr.

Ich habe mir erlaubt, diesen ersten, sicheren Vertreter der Gattung *Bolothrips* in Afrika, nach *Sir G. A. K. Marshall*, Direktor des Imperial Institute of Entomology zu benennen, dessen Verdienste um die Entomologie weltbekannt sind.

Hoplandrothrips jasmini, sp. n.

♂: Körper dunkelgraubraun, Schenkel ebenso, nur das Ende der Vorderschenkel und die Trochanteren gelblich, Vordertibien und Vordertarsen hellgelb, die ersteren in der Mitte bisweilen ganz undeutlich schattiert, Mittel- und Hintertibien am Ende deutlich, an der Basis nicht oder kaum merklich aufgehellt, Mittel- und Hintertarsen hellgelb, schwach grau getrübt. Borsten am Körper schwach getrübt, Kopfstacheln dunkel. An den Fühlern das 1. und 2. Glied wie der Kopf, das 2. am Ende etwas lichter, das 3. hellgelb, verschwommen und wolkig blassgraulich getrübt, das 4. in der Endhälfte (oder mehr), das 5. in den distalen zwei Dritteln wolkig grau, das 6. etwa im Grundviertel gelb, übrigens grau, das 7. und 8. Glied fast ganz dunkel. Vorderflügel deutlich grau getrübt, der ganzen Länge nach; Hinterflügel etwas ungleichmässig getrübt, indem der Vorderrand und ein Längsstreif etwas dunkler sind als der übrige Teil.

Kopf 242–248 μ lang, ohne Gipfel 216–225 μ, Augenlänge 102 μ, Wangen hinter den

Augen 138 μ lang. Postocularborsten von den Augen 12–20 μ weit entfernt, 104–120 μ lang, geknöpft; Kopfstachel zart, 3–4 Paare, nach hinten etwas kräftiger, der hinterste Stachel misst nur etwa 20 μ. Kopfoberfläche glatt. Mundkegel kurz, abgerundet. Fühler 450–467 μ lang, die Glieder messen bei der Type: 32 (42), 52 (33), 72 (44), 80 (40), 66 (32), 58 (27), 50 (24), 36 (13) μ. Areola des 2. Gliedes nahe der Spitze, das 3. Glied innen und aussen fast geradlinig, stark konisch, vor dem Ende stark verengt, mit gut entwickelten, dünn-zugespitzten Sinneskegeln, die am 3. Gliede 36–40 μ messen, hier 1 + 2, am 4. Gliede 2 + 2, am 5. und 6. 1 + 1^{+1}, am 7. 1d. Das 8. Glied ist vom 7. deutlich abgesondert, am Grunde parallelseitig oder etwas verengt. Prothorax 164–168 μ lang, vorn tiefbogig ausgeschnitten, Breite ohne Coxen 345, mit diesen 415 μ; Vordereckenborsten sehr lang, etwa 124–140 μ, gegen das Ende mehr oder weniger gebogen, am Ende stark geknöpft wie die übrigen. Lateralborsten 78–84 μ, äussere Hintereckenborsten 92–100, innere nicht messbar (abgebrochen); drei kleine, stachelartige und ein längeres, am Ende offenes Coxenbörstchen vorhanden, das letztere misst 60–64 μ. Vorderschenkel stark verdickt, innen am Ende mit zwei deutlichen Zähnchen, Vordertibien kräftig, im basalen Drittel, innen, mit einem Höckerchen oder Zähnchen, *das Ende der Vordertibien zahnartig ausgezogen*, Vordertarsen mit sehr kräftigem Zahn, der aus breiter Basis entspringt. Mesothorax vorn abgeschrägt, an den Vorderecken am breitesten, nach hinten schwach verengt, 407 μ breit (bei der Type stark gedrückt, 458 μ); Flügel mässig breit, gegen das Ende etwas verengt (Mesothrips-Form), mit 8–11 Schaltwimpern, Länge etwa 0·9 mm. Tergite des Abdomens vom 2.–7. mit zwei Paar Flügelsperrdornen, und zwei Paar starken, gelblichen Posterolateralborsten, wovon B. 2 des 8. Segmentes 112 μ misst. Borsten am 9. Segment, B. 1: 160 μ lang, gerade, mit schmalem Knopf, B. 2 dornartig, *aber ziemlich lang*, gebogen, 60 μ, B. 3 haarartig, spitzig, über 165 μ, B. 4 ebenso geformt, 128 μ lang. Tubus dorsal 144–152 μ lang (lateral 152–160), unten an der Basis sehr tief ausgeschnitten, am Grunde etwas verdickt, 84, am Ende 40 μ breit. Terminalborsten 140 μ lang. Hintertibien auf der Unterseite mit einer Reihe von 6–8 kurzen Börstchen.

♀: Nur 1 fühlerloses Stück vorhanden. Augen 108–116 μ lang, Wangen hinter denselben 132 μ, wie beim ♂ bedornt. Postokularborsten viel kürzer, 88 μ, dunkel, schmal geknöpft. Prothorax 145 μ lang, ohne Coxen etwa 310–330 μ breit. Vorderschenkel nicht oder kaum verdickt, Vordertarsen mit schwächerem Zähnchen. Vordereckenborsten des Prothorax 52–56, Lateralborsten 48 μ, Hintereckenborsten 92, bezw. 76 μ, alle getrübt; Coxenborsten wie beim ♂, aber alle schwächer. Mesothorax 415 μ breit. Vorderflügel mit 8–9 Schaltwimpern, die drei Flügelbasalborsten geknöpft, oder offen, 64, bezw. 80 und 92 μ lang. Beborstung des Abdomens ähnlich wie beim ♂, aber das 9. Segment mit B. 1, 2 schmal geknöpft, B. 1: 140, B. 2: 152, B. 1a (zwischen den beiden) 56 μ, spitzig, B. 3 gut 160 μ, haarartig, spitzig. Tubus dorsal 144 (lateral 148) μ lang, am Grunde 82, am Ende 36 μ breit. Terminalborsten 152 μ lang. Flügelfärbung wie beim ♂.

Diese Art ist, wenn mit den Arten verglichen, die an der Basis nicht aufgehellte Mitteltibien haben, wegen des kurzen, abgerundeten Mundkegels nur mit *natalensis*, Tryb., zu vergleichen, bei der aber die Vorderschenkel des ♂ innen nur 1 Zahn haben, auch sind zahlreichere Schaltwimpern vorhanden und die Vorderrandborsten des Prothorax länger. Vergleicht man mit den Arten, die an der Basis und am Ende hellgelbe Mittel- und Hintertibien haben, so kommt die neue Art nahe *approximatus*, Pr., *tridens*, Pr., und *schoutedeni*, Pr., aber die Flügel der neuen Art sind viel dunkler, das Dornbörstchen beim ♂ ist länger, aber schwächer, die Flügelbasalborsten bei beiden Geschlechtern viel länger, aber an der Spitze viel weniger stark erweitert, *H. tridens* hat viel längeren und schlankeren Kopf, viel längere Schläfen im Vergleich zu den Augen, viel schlankere Fühler mit innen ausgerandetem 3. Glied, gekörnelte

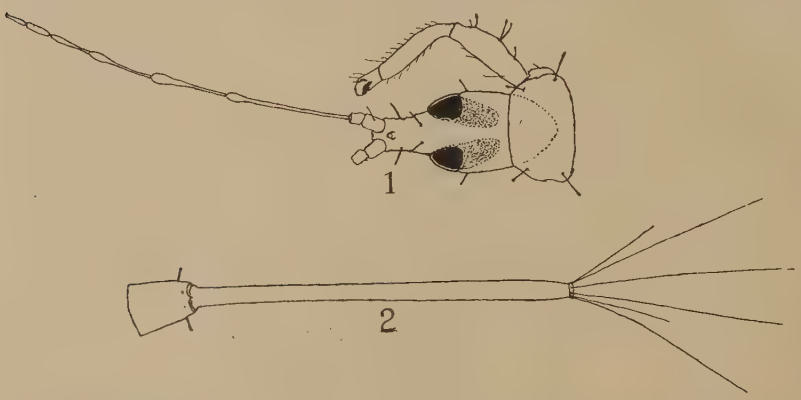
Kopfseiten, spitzigen Mundkegel, u.s.w.; *approximatus* hat spitzigen Mundkegel, innen ausgerandetes 3. Glied der Fühler und helle Flügel.

Fundort: Sierra Leone: Njala, 3.x.1932. an *Jasminum* sp. (*E. Hargreaves*) (No. 531).

Holurothrips leeuweni, sp. n.

♀: Körper im allgemeinen gelbbräunlich mit rötlicher Tönung (zahlreiche Chromatophoren); dunkel, braunschwarz sind: Der Kopf (an der Basis, bisweilen auch am äussersten Ende des Fortsatzes etwas aufgehellt), das 1. Fühlerglied (Basis etwas heller), klammerförmige Zeichnungen, wenigstens am 2. bis 4. Abdominalsegment, das 9. Segment und der Tubus. Beine ganz hellgelb, die Stabendplatte der Tarsen schwarz, ein undeutlicher Fleck an der Keule der Mittel- und Hinterschenkel oder nur an der Innenseite der Keule, dunkel. An den Abdominalsegmenten sind gewöhnlich auch die Hinterränder der Tergite angedunkelt. Körperborsten gelblich, Kopfborsten zum Teil dunkler. Fühlerglieder 2 und 3 hellgelb, das 2. an der Grundlinie gebräunt, 4. Glied hellgelb, im *mittleren Drittel* etwas getrübt, das 5. Glied nur im Grunddrittel hellgelb, sonst getrübt, aber das mittlere Drittel dunkler als das Enddrittel; 6. Glied grau, die Grundhälfte dunkler als die Endhälfte; 7. und 8. Glied grau. Die Insertionsporen der Fühlerborsten, sowie die Basis derselben dunkel.

Kopfform wie in fig. 1 skizziert, Mundkegel breit gerundet, Kopffläche konfluierend gerunzelt. Kopf samt Fortsatz 605 μ lang, ohne diesen 346–355, an den lateral 138 μ langen Augen, 303 μ breit, hinten wenig schmäler. Augen auf der Oberseite etwa 173 μ, unterseits 304 μ lang. Kopfgipfel 250–260 μ lang, am Grunde 147 μ, am Ende ebenso breit. Kopfgipfel unterseits mit 3 Paar feinen Borsten; er trägt oben 2 Paar getrübte



Figs. 1–2, *Holurothrips leeuweni*, sp. n.—fig. 1, ♀, Kopf und Prothorax; fig. 2, ♀, Ite Segment und Tubus.

Knopfborsten, hinter den hinteren Ocellen ist ein weiteres Paar gelegen. Ein hinter dem Niveau des Augenhinterrandes gelegenes, weiteres Borstenpaar, das voneinander wenig weiter absteht als das postocellare Paar, kann als postokulares Paar angesprochen werden. An den Wangen vor der Mitte zwei Knopfdörnchen. Das 1. Fühlerglied im ganzen mit fünf Knopfbörstchen, von denen das erste, dorsale, sehr dick ist. Das 2. Glied mit 7 Borsten, von denen nur 1 ventrales spitzig, zwei dorsale der übrigen geknöpften Borsten etwas stärker sind als die anderen. Das 3. Glied mit dünnem Stiel und an der Keule mit zwei kurzen, schmal geknöpften, schlanken Borsten; eine, am Ende unten stehende Borste ist lang (98 μ), spitzig; auch am 4. Gliede sind noch einge Borsten geknöpft, am 5. erkenne

ich aber nur mehr zwei schwach geknöpfte dorsale. Areola des 2. Gliedes nahe der Spitze. Sinneskegel: Glied 3: 1 + 1; 4: 1 + 1; 5: 1 + 1; 6: 1d; 7: 1d. Accessorische Kegel fehlen. Fühlerlänge 1·71 mm. Gliederlängen(-breiten): 100–104 (73–76, gleichbreit), 67 (B. 56, Sp. 48), 562 (36), 305 (35), 280 (32), 177 (29), 118 (22), 106 (18) μ. Prothorax 225 μ lang, ohne Coxen 433 μ breit; Borsten dick, geknöpft, auf Höckern sitzend, nur sehr schwach gebogen, die Vorder wie die Hintereckenborsten 77–87 μ lang. Vorderschenkel am Aussenrande mit 3 Paar dicken, kurzen Knopfborsten, von denen das proximalste Paar am kleinsten ist. Schenkel nicht verdickt, wie die Schienen und Tarsen vollkommen unbewehrt. Mesothorax 570–588 μ breit, Metathorax ein wenig breiter, seine Cuticula mit winzigen Körnchen versehen. Flügel fehlen. Abdomen im kontrahierten Zustande breit oval, am dritten Segmente am breitesten (gepresst 865 μ) dann gegen das Ende stark verengt. Das 9. Segment etwas länger als breit, nach hinten verengt, seine Fläche, besonders unten, mit kleinen Börstchen, die aus dunklen, kleinen Poren kommen. Hinterrand des 9. Segmentes oben in ein kurzes Zäpfchen ausgezogen. Von den gelblichen Knopfborsten der Abdomenseiten ist je die äussere länger als die innere, am 2. und 3. Segment erstere 104–130 μ lang, am längsten etwa am 4. Segment, gegen das Abdomenende kürzer, am 8. nur mehr 70 μ, das 9. Segment trägt oben zwei Paar sehr kurze, dicke Stifte (35–52 μ), unten ein Haarborstenpaar (125 μ). Tubus dicht mit Borsten besetzt, im letzten Viertel fast kahl, 1·59 mm. lang, ziemlich gleichbreit oder knapp hinter der Basis etwas schmäler als am Ende. Breite des Tubus am Grunde 105, vor dem Ende 81, am äussersten Ende 60 μ. Terminalborsten sehr lang, 1·03 mm., also 2/3 der Tubuslänge.— Körperlänge: 4·98 mm.

♂: Vom ♀ nur in der Form des 9. Sternites und durch den Tubusausschnitt verschieden.

Von *Holurothrips ornatus*, Bagn., nicht nur durch den Mangel der Flügel, sondern auch in der Färbung verschieden; bei *ornatus* ist die Gesamtfärbung schwärzlichbraun, Thorax heller, der Tubus ist aber gelblich, an der Basis grau getrübt, gegen das Ende allmählich schwarzbraun. Die Abdominalborsten sind bei *ornatus* farblos, bei *leeuweni* gelb, ein sicherlich wichtiger Unterschied.

Das Genus *Holurothrips* hat mit *Leeuwenia* ausser der bedeutenden Tubuslänge wenig gemein. Es scheint mehr Aehnlichkeit mit *Zeugmatothrips* zu haben. Es wäre auch möglich, dass *Hystricothrips* mit *Holurothrips* näher verwandt ist als mit *Leeuwenia*, die wohl eine eigene Tribus erfordern werden.

Fundort: Java: Salak, 1600 m., 21.xii.1927, an abgefallenen, trockenen Blättern, von *W. M. Docters van Leeuwen* in Anzahl gefunden.

SOME BEES (HYM.) FROM THE SUDAN

By T. D. A. Cockerell, F.R.E.S.

Through the collections sent to the Imperial Institute of Entomology, the peculiar Sudanese bee-fauna is gradually becoming known. The species show in general the pale colours and other peculiarities of a desert fauna, and find their principal relatives in Arabia and adjacent parts of Asia. The work has not yet progressed sufficiently to justify statistical treatment, but the impression gained is that there is less affinity with the fauna of the northern coast region of Africa than one might expect. On the other hand, material from Arabia is at present so scanty that adequate comparisons with the Arabian fauna are impossible. It can be said, however, that several species first described from S.W. Asia have turned up in the Sudan. The following account relates to a parasitic bee, and two species of *Colletes*, either of which may be its host.

Epeolus diodontus, sp. n.

Male. Length 6·3 mm.; robust, head and thorax densely covered with fine felt-like tomentum (as seen under lens, the microscope shows pointed scale-like hairs, not actually covering the surface, the black showing through), which is tinged with yellow dorsally, but otherwise pure white; tegument of head and thorax black, but the tubercles, the long pointed keeled axillae, and two obscure spots on scutellum are red; a small black exposed area in middle of metathorax. Eyes reddish-grey; labrum simple, it and the mandibles dull pale yellowish; scutellum bigibbous, the elevations pointed; tegulae light ferruginous; wings hyaline, the apical field very faintly dusky; stigma light orange, nervures brown; basal nervure going far basad of nervulus; second cubital cell receiving first recurrent nervure near middle; legs light red, with fine white tomentum, middle and hind femora suffused with blackish; spurs pallid; abdomen with very broad entire creamy-white hair-bands, the black tegument represented by broad bands at bases of tergites 2 to 4; first tergite covered with tomentum, except a narrow straight transverse band; apical plate red, strongly bidentate; venter with very broad white bands, and modified hairs in sub-apical region.

Sudan: Khow Arbaat Delta, flying over sand, 27 April, 1926 (*H. B. Johnston*). Imperial Institute of Entomology. Nearly related to *E. subrufescens*, E. Saunders, from Algeria, which is larger, with testaceous-brown abdomen. Saunders had only the female of his species, so that it is impossible to say whether the end of the male abdomen is bidentate. *E. aureovestitus*, Dours (of which I have a female collected by Escalera in S.W. Persia), is also related.

This *Epeolus* is very likely parasitic on the following *Colletes*, of which seven males were taken in the same locality.

Colletes resedae, sp. n.

Male. Length 9 to 10 mm., anterior wing nearly 7; rather slender, black, including the long flagellum, the last tarsal joint red at end; hair of head and thorax long and abundant, pure white on face, cheeks, and underside of thorax, but on thorax above and region of tubercles clear orange-ferruginous, with no dark hairs, and the long occipital fringe is similarly coloured; malar space large, a little broader than long; middle joints of flagellum much longer than broad; tegulae small, pale reddish testaceous; wings clear hyaline; stigma very pale brown, nervures brown; basal nervure falling short of nervulus; second

cubital cell very broad, receiving first recurrent nervure well before middle; legs slender, with white hair; a red mark at extreme apex of tibiae; abdomen excessively finely and densely punctured, about the same on the first three tergites; first tergite with the usual long hair at base; tergites 1 to 6 with very dense entire bands, more or less suffused with yellow, the first three bands broad and subequal (but first broadest), the other successively narrower, that on sixth quite narrow; venter with narrower white bands; sagittae with very stout black inner ribs, and excessively broad wings, which have a densely punctate surface, and are blackish, with pallid margin; stipites with a stout cylindrical base, and a very slender apical part, beset with extremely long plumose blackish hairs.

Sudan: Khar Arbaat Delta, 26 April, 1926, at flowers of *Reseda*, seven males (*H. B. Johnston*). In Morice's table (1904), as the sixth sternite has no sort of fovea, it runs nearest to *C. phalericus*, Morice, but the genitalia are very different. The sagittae quite closely resemble those of *C. abeillei*, Pér., but the stipites are very different, being more similar to those of *C. graeffei*, Alfken. The very finely and densely punctured first tergite at once distinguishes it from *C. alluaudi*, Ckll., and *C. hylaeiformis*, Eversm.; in this respect it resembles rather *C. fodiens* (Fourc.), which has a shorter malar space, and quite different stipites, though the sagittae are of a similar pattern only narrower. The sagittal wings of *C. resedae* have their apical point mesad, as in *C. graeffei*, not distad as in the American *C. griseus* (Westwood).

Although the above species of *Colletes* was found at the same place as *Epeolus diodontus*, there is another species from the Sudan which might better claim to be the host, on account of the small size and especially the scale-like hairs on thorax.

Colletes salsolae, sp. n.

Female. Length about 7·5 mm., anterior wing nearly 5; black, including legs and mandibles, but the short flagellum (the middle joints not longer than broad) bright ferruginous beneath except at extreme base; face and front covered with white hair; clypeus densely punctured but glistening; eyes very dark brown; malar space about twice as broad as long; cheeks, sides of thorax and metathorax with white hair, tubercles with pale yellowish hair; thorax above densely covered with light yellowish hair, very short and moss-like in form, rather long on scutellum, but on mesothorax approaching the scale-like condition of the *Epeolus*; plicae at base of metathorax numerous and close-set; tegulae hyaline; wings perfectly clear, stigma small, pale yellowish, nervures very pale; basal nervure falling considerably short of nervulus; second cubital cell large, not much contracted above, receiving first recurrent nervure a little before middle; abdomen extremely finely punctured, the hind margin of first tergite reddish; first tergite entirely covered with dense felt-like slightly yellowish hair; second to fifth with very broad even greyish-white hair bands, the second also with a basal band, leaving the black (exposed) part narrower than the apical hair-band; venter with narrow white bands.

Sudan: Khor Garar Abyod, visiting flowers of *Salsola*, 26 March, 1926 (*W. Ruttledge*). Imperial Institute of Entomology.

This resembles *C. brevitectus*, Ckll., from Quetta, but is smaller, with pale stigma and veins, and no exposed dark band on first tergite. *C. graeffei*, Alfk., has moss-like fox-red hair on mesothorax, and darkened wings. The larger *C. carinatus*, Rads., also has moss-like hair on thorax above.

ON SOME SPECIES OF CHRYSOMELIDAE (COL.) IN THE BRITISH MUSEUM

By S. H. Chen.

The following notes deal with beetles of the subfamilies Chrysomelinae and Halticinae, chiefly from oriental and tropical Asia, which came under my notice during my period of study of the collections in the British Museum.

I should like to take this opportunity of expressing my gratitude to Dr. Blair, Mr. Bryant and Dr. Scott for their kindness in giving me full access to all the material of the groups mentioned above, and to Prof. Maulik for much kind help and assistance given me throughout my stay.

The types of all the species described below are in the British Museum.

Chrysomelinae.

Ambrostoma sublaevis, sp. n.

Described from about a dozen examples.

Length, 9–10 mm.

Body rather convex. General colour metallic bluish-green, alternating here and there with purplish spots or bands. The underside, the vertex, the lateral margins and the disc of the pronotum have purplish spots, and on the elytra are three longitudinal bands. Antennae brownish-black, their bases cupreous.

Head broad, finely and very sparsely punctate, the punctures near the inner margins of the eyes being coarser and closer; clypeus deeply depressed, separated by a triangular impression. Antennae extending a little beyond the pronotum, first segment thickened, third nearly twice as long as second, fourth shorter than third but longer than second, fifth almost equal in length to the fourth, the following slightly thickened and more or less equal to each other. Prothorax broader than long, anterior margin widely emarginate, sides sinuate, convex in the middle, narrowed towards the base, anterior angles acute but rounded, posterior almost right angles, each of the four angles bearing a seta; basal margin very feebly sinuate on either side; surface very finely punctate, the punctures near the base on each side and on the lateral longitudinal depressions much stronger and somewhat closer. Scutellum semicircular, smooth and impunctate. Elytra broader at the base than the prothorax, marked behind the humerus (which is hardly distinct) with a deep transverse depression extending from the basal margin to a little distance from the suture; surface, under a high power, extremely finely but sparsely punctate, the punctures on the post-basal transverse depression are very strong. Underside sparsely punctate.

Hab. Korea * (*J. C. Bowring*).

This is the fifth known species of the genus. It is very closely related to *A. mahesa*, Hope, from Nepal, but differs in not having the short row of strong punctures on the inner edge of the humerus extending to the transverse depression. The colour patterns only differ slightly.

Phaedonia inclusa, Stål.

Plagiodera inclusa, Stål, 1858, Öfv. Vet. Akad. Förh., **15**: 252.

This Javanese species should be placed in the genus *Phaedonia* which was

* There is an entry by Dr. C. J. Gahan in the British Museum Register that specimens so labelled "belong to species of a distinctly North Indian type, so that I think there must be some mistake here."—K. G. Blair.

described by Weise for the reception of an African species, *P. aereata*, F. It differs from *Plagiodera* species by having neither the prosternum produced posteriorly nor the anterior margin of the mesosternum truncate and bordered. The epipleuron of the elytra is horizontal, not concave or reflexed. In comparing the genus with *Plagiodera* (1898, *Arch. Naturges.* **64,** 1 : 212), Weise said that it was subapterous. Examination of both the African and Javanese species shows, however, that they all have well-developed wings.

Var. **indica,** var. n., differs from *inclusa* by having the elytra of a uniform reddish-brown colour, whereas the lateral margins of the elytra of *inclusa* are yellowish with the disc deep brownish and cupreous.

Hab. India (Bowring Coll.).

Plagiodera septemvittata, Stål.

This Chinese species is characterised by the yellowish colour of the body and, as the name indicates, by the seven longitudinal, deep bluish cupreous bands of the elytra. The anterior margin of the clypeus has a V-shaped emargination. The second and third segments of the antennae are almost equal.

Var. **trilineata,** var. n.—Elytra with three piceous longitudinal bands, one on the suture and one in the middle of each elytron extending from a little below the base to near the apex. The marginal space of the elytra is more densely punctate laterally.

Hab. Philippine Is. (*Semper*).
Described from two examples.
Length, 5 mm.; *breadth*, 4 mm.

Plagiodera bryanti, sp. n.

Length, 4·5–5 mm.; *breadth*, 3·5–4 mm.

Body rounded, slightly narrowed at the posterior end, very convex. Colour of head, prothorax and underside brownish red; elytra metallic blue, sometimes greenish-blue, the lateral margins reddish-brown; base of antennae brown, the six apical segments black; scutellum dark brown.

Head minutely punctate, slightly depressed in the middle, the line of demarcation between the clypeus and front obsolete in the middle. Antennae rather robust, passing just beyond the base of the pronotum; first segment thickened, second thicker but hardly longer than third, fourth almost equal in length to the third, the last six segments are more hairy and become broader towards the apex, forming a thickened club. Prothorax three times as broad as long, front margin narrower than base, widely emarginate, sides gently convex, basal margin uniformly and widely arched, anterior angles rounded; upper surface sloping from base to front, smooth and shining; when seen under a higher power, it is very finely punctate with a few stronger scattered punctures towards the sides. Scutellum triangular, smooth and impunctate. Elytra strongly convex, slightly broader than the prothorax at base; anterior lateral angles rounded; humerus raised, prominent; surface closely covered with punctures which tend to be arranged in irregular rows; marginal space slightly raised, broader at the base and slightly narrower towards the apex, with one row of punctures along the middle, another along the inner side of the lateral margin and a third one containing punctures distantly placed, parallel and near to the outer row. Between these rows, a few small scattered punctures can be seen. Underside smooth, impunctate. Epipleuron of elytra broad, with the outer-half obliquely reflexed.

Hab. Perak (*Doherty*); W. Sarawak: Quop (*G. E. Bryant*). Described from nineteen examples of which one is from Perak.

This species is intermediate between *versicolora*, Laich., and *rufescens*, Gyll. It may be distinguished from both of them by its colour pattern and the punctuation of the marginal space of the elytra.

Halticinae.

Phygasoma castanea, sp. n.

Length, 8 mm.; *breadth*, 5 mm.

Body elongate, ovate; general colour, shining deep red with a metallic sheen and a certain amount of piceous. Antennae black, except the four or five basal segments which are dark red and the apical one which is pale yellow.

Head with the vertex smooth, very finely and sparsely punctate, interantennal space moderately narrow, feebly raised; frontal tubercles not well developed, triangular, separated from the vertex by a more or less obsolete impression; the ocular area above the insertion of the antennae raised and extending to the interantennal space, separated from the frontal tubercles by an oblique line running backwards to the posterior margin of the eye. Antennae filiform, first segment club-shaped, second thicker but a little shorter than the third, fifth and following almost equal to each other in length, slightly thickened and each longer than the fourth. Prothorax transverse, finely and rather sparsely punctate, the ante-basal impression strongly bisinuate, each end terminating at the base; anterior angles thickened, each bearing a seta at the posterior end of the thickened margin; sides nearly straight, base not margined. Scutellum smooth, impunctate. Elytra broader at the base than the prothorax, narrowed behind, with a transverse impression behind the humerus, the latter strongly prominent and impunctate. The elytral punctures seem to be arranged in semi-regular rows; those on the short scutellar row, on the anterior part of the row within the humerus, on the base and on the transverse depression, are rather strong, those near the suture and lateral margins are also stronger than those on the remainder of the surface of the elytra, where the punctures are practically invisible. Underside shining and smooth, with a few very scattered punctures; posterior femora strongly incrassate, tibiae not channelled on their dorsal side; mesosternum in the shape of a narrow transverse raised ridge; prosternum rather broad, anterior coxal cavities open behind.

Hab. W. Sarawak: Quop (*G. E. Bryant*).
Described from ten examples.

At first sight, this species would be easily taken to be a *Sphaerometopa*, Chapuis, but in that genus the pronotum is not marked with an ante-basal transverse impression and the prosternum is very narrow, almost concealed from view by the convexity of the coxae.

Chabriosoma, gen. n.

Body oval, moderately convex. Head broad, vertex convex, impressed by a longitudinal, but almost obsolete line in the middle: frontal tubercles not very prominent, transversely triangular, separated from the vertex by a transverse impression, interantennal space broad and smooth. Antennae filiform, widely separated at their base (though well away from the inner margin of the eye) and extending to near the middle of the elytra, second segment very small. Prothorax much broader than long, somewhat narrowed behind, anterior angles thickened, each of the four angles bearing a seta, sides slightly reflexed; in front of the base and parallel to it is a transverse and bisinuate impression extending to the sides. Elytra scarcely broader at the base than the prothorax, surface very faintly and confusedly punctate.

Prosternum narrow but distinct, slightly widened behind and rounded at the posterior margin; anterior coxal cavities open behind. Posterior femora strongly incrassate, tibiae not channelled on the dorsal side, somewhat cylindrical, the posterior pair each terminated beneath by a small spine; first segment of the posterior tarsi as long as the two following together; claws appendiculate.

Genotype : *Chabriosoma thoracica*, sp. n.

This genus is characterised by :—

1. The open anterior coxal cavities; 2. The wide and smooth interantennal space; 3. The ante-basal, transverse, bisinuate impression on the pronotum; 4. The almost impunctate elytra; 5. The sub-cylindrical tibiae.

It is most closely related in structure to *Chabria*, Jac., from which it may be distinguished by the presence of the ante-basal impression on the pronotum.

Chabriosoma thoracica, sp. n. (Fig. 1.)

Length, 7·5–8 mm.; *breadth*, 4·3–4·8 mm.

Body oval. Colour of the head, prothorax, legs and the last two or three abdominal segments reddish-brown, the rest of the underside bluish-black; antennae with the three or four basal segments reddish-brown, the middle ones dark brown and the two apical ones pale yellow; vertex marked with two small rounded black spots, the pronotum with one similar spot in the centre; elytra violaceous; scutellum dark reddish-brown.

Fig. 1.

Head broad, anterior margin of labrum not emarginate; interantennal space broad and smooth, frontal tubercles large, not sharply marked, but distinct; vertex rather smooth, seen under a high power to be very sparsely and finely punctate; close to the inner posterior margin of the eyes are three or four large punctures. Antennae extending to near the middle of the elytra, first segment club-shaped, second thicker but half as long as the third which is slender, third and the following ones nearly equal to each other in length, the last pointed. Prothorax twice as broad as long, sides slightly rounded, basal margin with a small median lobe; at the anterior angles, the margins are thickened and truncate, each with a seta at its posterior end; surface smooth, marked with some microscopical punctures, the ante-basal impression shallow, but somewhat deeper near the sides. Scutellum triangular, smooth. Elytra oval, irregularly and very faintly punctate; epipleura moderately broad and plain, disappearing near the apex. Underside covered with fine hairs.

Hab. Borneo : Kina-Balu (*Whitehead*).

Described from six examples.

The present species has a deceptive resemblance to *Phygasoma borneensis*, Jacoby, but it may be easily distinguished from the latter by the generic characters as follows :

Chabriosoma, gen. n.	*Phygasoma*, Jac.
Interantennal space broad, even; posterior margin of prosternum rounded at each side.	Interantennal space much narrower, channelled; posterior margin of prosternum produced at each side.

Chabria, Jac., and *Dimax*, Wse.

Weise erected the genus *Dimax* in 1893 (*Ins. Deutschl.*, **6** : 1052) for those species of *Argopus* which have the apical segments of the antennae whitish-yellow and the interantennal space broad. Later, he described one Philippine species (*D. media*, Wse., 1913, *Philipp J. Sci.*, D., **8** : 235) and mentioned two other species, namely, *Argopus angulicollis*, Clark, and *Sphaeroderma laevipennis*, Jac., to be placed in this genus. I have not seen *D. media*, but of the two other species, the type of the former, and specimens determined by Jacoby of the latter, were examined. In comparing these two species with *Chabria nigrofasciata*, Jac. (*Proc. Zool. Soc.*, **1887** : 93), I could not find any very important differences between them. However, the following points may be noticed :—

Chabria.	*Dimax*.
1. Body more convex, pronotum and elytra apparently impunctate.	1. Body less convex, pronotum and elytra very finely punctate.
2. Frontal tubercles obsolete.	2. Frontal tubercles fairly distinct.
3. Anterior setae situated at some distance from the posterior end of the thickened anterior margin of the pronotum.	3. Anterior setae situated at the posterior end of the thickened antero-lateral margin.
4. Prosternum rounded at the posterior margin.	4. Prosternum somewhat truncate at the posterior margin.

Since the differences are only slight and intermediate forms occur, I prefer to treat them as synonymous. Examinations of the types or cotypes of the following species has shown that they should be placed in the genus *Chabria* :—

nigrofasciata, Jac. (genotype, *Chabria*) . .	Ceylon.
druodecimplagiata, Mlk.	S. India.
discoidalis (*Sphaerometopa*), Jac. . . .	Java.
bimaculata (*Sphaeroderma*), Jac. . . .	Sumatra.
angulicollis (*Argopus*), Clark	Sarawak, Singapore, Pulo-Penang.
laevipennis (*Sphaeroderma*), Jac. . . .	Sumatra.
jacobyi, nom. n. (*Sutrea apicicornis*, Jac., nec *C. apicicornis*, Jac., 1887) . . .	Borneo.
flava (*Sutrea*), Jac.	Philippine Is.
javanensis (*Sphaeroderma*), Jac.	Java.
celebensis (*Sphaeroderma*), Jac.	Celebes.
ornata (*Sphaeroderma*), Baly	Cambodge.

According to Jacoby's descriptions of *Sphaeroderma flavicollis* and *Sutrea quadrimaculata*, these two species should also be placed in this genus.

Chabria octomaculata, sp. n. (Fig. 2.)

Length, 5–5·5 mm.; *breadth*, 3–3·4 mm.

Body oblong, subquadrate. Colour flavous, with the head, prothorax and lateral

margins of the elytra and underside more brownish. Antennae with four basal segments brown, the following blackish and the apical one yellow. Each elytron with four small rounded black spots of which two are basal: one placed on the humerus and the other at an equal distance between the humerus and scutellum; two median, the outer one is placed near the lateral margin and is a little in front of the inner one which is near the suture.

Fig. 2.

Head smooth, with some microscopical punctures on the vertex, frontal tubercles well developed, obliquely placed and widely separated from each other. Antennae extending to near the middle of the elytra, first segment club-shaped, second much shorter than third, fourth slightly longer than third and almost equal to each of the following segments. Prothorax transverse, antero-lateral angles widely rounded, the thickened margin not extending to near the middle; base somewhat straight at each side with the median lobe scarcely produced; surface smooth, not visibly punctate; an oblique groove extending from the middle of lateral margin to the base is fairly visible. Elytra subparallel, apparently impunctate, the punctures being extremely fine.

Hab. W. Sarawak: Mt. Matang (*G. E. Bryant*).

Described from four examples.

This species may be separated from its congeners by the parallel-sided body, and the maculation of the elytra.

Chabria bryanti, sp. n.

Length, 4·5–5 mm.; *breadth,* 3·4–3·8 mm.

Body oblong, subquadrate, rather convex. Head and prothorax pitch-brown, elytra blackish with the posterior part and sometimes the lateral margins light piceous, with a large transverse, yellowish-brown band placed just above the middle of the humerus and extending laterally to the marginal space; antennae with the three or four basal segments dark brown, the following black and the apical one pale yellow.

Head not smooth but with very fine wrinkles; front finely and sparsely punctate, frontal tubercles triangular, more or less obsolete, separated from each other by a central longitudinal furrow. Antennae widely separated at their base, about half the length of the body; first segment club-shaped, third about one and half times longer than second and almost equal to fourth, the following segments stouter, more or less equal to each other, the last one pointed at apex. Prothorax twice as broad as long; sides slightly rounded, the thickened antero-lateral margin somewhat compressed and extending to near the middle where there is a seta; near the posterior angle is another thickened area situated inside the margin and separated from the disc by an oblique groove; base with the median lobe slightly produced; surface with fine wrinkles as those on head, sparsely and minutely punctate. Scutellum triangular. Elytra scarcely broader at base than prothorax, minutely, but distinctly punctate.

Hab. Sarawak (*G. E. Bryant*).

Described from five examples.

Allied to *C. angulicollis*, Clark, and **C. jacobyi,** nom. n. (*Sutrea apicicornis*, Jac.), but is of a quite different coloration and less narrowed behind. From *C. octomaculata*, it may be separated by the body being less parallel-sided and the elytra distinctly punctate.

Sphaerocderma subacutangula, sp. n.

Length, 3·5 mm.; *breadth*, 2·5 mm.

Form oblong, more or less subquadrate, very convex. Head and prothorax shining red-brown; antennae black with the three basal segments red-brown; elytra violaceous-blue; underside dark piceous.

Head with the vertex smooth and impunctate; labrum large; clypeus depressed anteriorly; interantennal carina rather sharp; frontal tubercles well-developed, transversely subquadrate, the line of demarcation separating them from the vertex rather deeply impressed. Antennae extending to the middle of the elytra, first segment club-shaped, second slightly shorter than third, fourth scarcely longer than third, the following segments more or less equal in length, elongate, the apical ones slightly thickened. Prothorax more than twice as broad as long, anterior margin gently concave, basal margin sinuate at each side with a median lobe rather broadly rounded and produced; sides nearly straight with margins reflexed; anterior angles produced but not so strongly as in *S. acutangula*, Jac.; surface minutely and sparsely punctate. Scutellum triangular, smooth, impunctate. Elytra at the base as broad as the prothorax, somewhat narrowed behind, their punctuation in irregular rows, the punctures more closely placed and somewhat confused near the suture, marginal space slightly convex, smooth. Underside rather closely and strongly punctate. Posterior tibiae not channelled on the dorsal side.

Hab. Burma : Ruby Mines (*Doherty*).
Described from one example.

This species may be distinguished from its allies by the coloration of the body, the anterior angle of the pronotum and the non-channelled posterior tibiae.

Argopus (*Sphaeroderma*) *unicolor*, Jac. (Proc. Zool. Soc., **1885 :** 736), has a bilobed clypeus and should be placed in the present genus. Type in the British Museum.

Sebaethe nigricornis, Baly, and *S. ceylonensis*, Jac., have the claw segment of the posterior tarsi greatly dilated and should be placed in the genus *Hyphasoma*, Jac.

The genus *Argopistes*, Motsch., has many peculiar characters, of which the following may be cited :—

1. Eyes very closely placed; 2. Interantennal space extremely narrow; 3. Prosternum raised, broad and deeply channelled at the posterior end; 4. First abdominal segment with two carinae on each side below the posterior coxae; 5. Posterior femora strongly incrassate, triangular in shape; each of the posterior tibiae with a broad and somewhat curved spine; the posterior tarsi do not arise from the end of the tibiae but at some distance from it.

Argopistes biplagiatus, var. **rufus,** var. n. Deep red, without any marks or spots. China (*Bowring*). Described from four examples.

This species is rather widely distributed. There is one specimen (*biplagiatus*, Motsch.) in my collection from Hangchow (Chekiang).

ON SOME SPECIES OF CHRYSOMELIDAE (COL.) IN THE BRITISH MUSEUM (*continued*)

By S. H. Chen.

Chilocoristes, Weise.

This genus may be distinguished from its allies by the incrassate maxillary palpi, the last two segments of which form a spherical globule.

Acrocrypta pallida, Baly (1877, *Ent. Mon. Mag.*, **13** : 224), from Sumatra, should be placed in this genus.

Chilocoristes pallidus var. **septemmaculatus**, var. n.

Length, 5 mm.; *breadth*, 4·5 mm.

Brown or reddish-brown, with two rounded black spots at the base of the pronotum and five somewhat larger black spots on the elytra, one being in the middle and common to both, which is apparently the union of two small spots, two smaller ones on each elytron, in line with the middle one and placed near the lateral margin, and the other post-median placed at some distance from the apex. Antennae reddish-brown.

Head with the frontal tubercles transversely oblique, vertex scarcely punctate. First segment of antennae nearly as long as the three following together. Elytra finely and rather closely punctate, the lateral rows more distinct than those near the suture.

Hab. W. Sarawak : Quop (*G. E. Bryant*).
Described from one example.

Chilocoristes pallidus var. **nigrofasciatus**, var. n.

Length, 5·5 mm.; *breadth*, 4·8 mm.

Brown, antennae with the four apical segments slightly blackish; pronotum with a basal black transverse band (not extending to the sides) which is probably the result of fusion of two spots; each elytron with a longitudinal black band extending from a level below the humerus to the post-median and placed at some distance from the suture, another rounded spot placed a little anterior to the middle near the lateral margin.

Hab. Sarawak : Retuh (*G. E. Bryant*).
Described from one example.

Eucyclomela, gen. n.

Body hemispherical. Head small, inclined in front; maxillary palpi small and slender, the last segment elongate and pointed at the apex; clypeus large, cuneiform; interantennal space very narrow and longitudinally channelled; frontal tubercles transverse, obsolete; the raised ocular area sending off from each side a narrow branch to between the bases of antennae. Antennae with the first segment extremely long and equal to the four following together, the apical segments thickened. Prothorax very convex, without any depression, base sinuate at each side and with a large median lobe. Scutellum small, triangular. Elytra broader than prothorax, punctate-striate, their epipleura deeply concave.

Underside :—Prosternum broad, transverse; anterior coxal cavities open behind. The anterior margin of the metasternum extends forwards, covering completely the mesosternum and reaching the posterior margin of prosternum. Legs robust, posterior femora strongly incrassate, all the tibiae channelled on their dorsal side toward the distal end, the posterior ones each with a small spine at the apex; third segment of tarsi entire, the lobes fused together; claws appendiculate.

Genotype : *E. clypealis*, sp. n.

This genus is intermediate between *Chilocoristes*, Weise, and *Eucycla*, Baly. From the former, it may be distinguished by the long first antennal segment and the small and slender maxillary palpi; from the latter, by the deeply concave epipleura and the entire third segment of the tarsi. This latter character is also common to the following genera: *Sphaeroderma*, Steph., *Argopus*, Fischer, *Argopistes*, Motsch., *Chilocoristes*, Weise, and *Pentamesa*, Harold. Although in *Sphaeroderma testaceum*, the longitudinal furrow on the ventral side of the segment gives it a bilobed appearance, but, on looking at the dorsal side, it is seen to be not divided. This fusion of the lobes of the third tarsal segment is considered an essential character of the subfamily CHRYSOMELINAE, although there are many genera which do not follow this rule.

Eucyclomela clypealis, sp. n. (Fig. 3.)

Length, 5–6 mm.; *breadth*, 4·5–5·5 mm.

Body hemispherical. Colour reddish-brown to testaceous, the six apical segments of the antennae black, pronotum with two rounded black spots at the base and each elytron with two generally larger spots placed in a transverse line near the middle, the inner one longer than broad, the outer somewhat rounded.

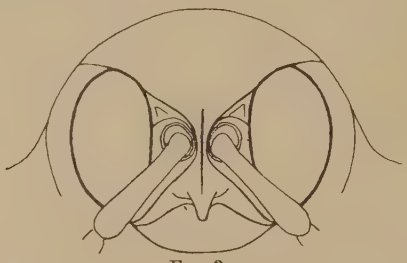


FIG. 3.

Head with the vertex smooth and scarcely punctate; interantennal space narrow and channelled, frontal tubercles oblique, not well developed and not noticeable in some individuals; clypeus large, somewhat sinuate on each side and with a tooth-like projection in the middle in the male, labrum slightly bisinuate at the anterior margin, with a few punctures each bearing a long hair. Antennae extending to the base of the prothorax, first segment very long and club-shaped, each lying in a furrow between the margin of the eyes and the clypeus, second segment a little longer than third, fourth shorter than third, the following ones progressively dilated and thickened, somewhat broader than long. Prothorax more than twice as broad as long, anterior margin concave, sides reflexed and slightly rounded, each angle bearing a seta; surface finely and closely punctate. Elytra strongly convex, basal angles widely rounded, surface more coarsely punctured than the pronotum, the punctures regularly arranged in ten rows (including the short scutellar row) on the disc; intervals sparsely punctate, more densely near the suture, marginal space broad, with a row of distantly placed punctures down the middle and some scattered ones on the outer half.

Underside smooth, legs robust, the posterior coxae closer together than the two anterior pairs; tibiae channelled.

Hab. BORNEO: Kuching (*Lewis*); PERAK (*Doherty*).

Described from eleven examples, one being from Perak.

This species is of the form of *Chilocoristes*, Weise, from which it may be at once distinguished by the generic characters.

Var. **inornata,** var. n. Without spots.

Hab. Sumatra (*Doherty*).
Described from two examples, a male and female.

Eucycla, Baly.

Eucycla aeneipennis, Baly, and *E. elegantula*, Jac., prove to be the same species. The types of both are in the British Museum, that of Baly being a male and that of Jacoby a female. The male has the antennae longer than the body, while in the female they extend only to near the middle of the elytra; the segments are thickened from the fourth to the apex, each being more than twice as long as broad in the male and only a little longer than broad in the female; in the male, the apical segments are thinner than the preceding ones and the last is compressed and curved at the apex, whereas in the female it is scarcely compressed and hardly curved.

Eucycla longicornis, sp. n.

Length, 2·8 mm.; *breadth*, 2·4 mm.

Body somewhat rounded, narrowed in front and behind, very convex. Colour reddish with the antennae fulvous.

Head with a few very fine punctures and a longitudinal furrow on the vertex; interantennal space extremely narrow and channelled; above the base of the antennae is a transverse depression which extends to the inner margin of the eyes. Antennae filiform, a little longer than the body, first segment long and club-shaped, slightly shorter than the three following together, second shorter than third, fourth longer than third or fifth, fifth and the following segments not thickened, elongate, more or less equal to each other in length, the apical one compressed and curved at the apex. Prothorax more than twice as broad as long, lateral margins straight, surface finely and rather closely punctate. Elytra punctate-striate, interstices very finely and sparsely punctate, marginal space somewhat convex with a row of small punctures in the furrow.

Hab. Java: Silabintanah (*G. E. Bryant*).
Described from one example, a male.

Eucycla duodecimmaculata, sp. n.

Length, 3–3·4 mm.; *breadth*, 2·5–2·8 mm.

Body rounded, very convex. Colour yellowish-brown, with twelve rather large spots of light piceous distributed as follows: two small ones on the basal part of the pronotum, five on each elytron, of which two are placed in a transverse line near the base with the outer one smaller and covering the humerus, two median, and the fifth placed below the middle at a certain distance from the apex.

Head with the vertex almost impunctate, frontal tubercles absent, the ocular area sending inward from each side a branch to the interantennal space; clypeus large, triangular. Antennae extending to the humerus, first segment as long as the three following together, second thicker and longer than the third which is slender, fourth almost equal in length to the third, the five apical segments thickened, somewhat broader than long. Prothorax twice as broad as long, base produced and rounded in the middle, sides almost straight, posterior angles oblique; surface finely and sparsely punctate. Elytra punctate-striate, the punctures arranged in nine and a half rows on the disc, those near the suture and at the apex somewhat irregularly placed, interstices with a few scattered punctures, marginal space broad, slightly convex and only slightly narrowed behind, with some very fine punctures and two rows of stronger punctures close to the margin, the outer row of

punctures being placed in the furrow and the inner one containing punctures distant from each other.

Hab. Korea (*S. Ichikawa*).

Described from two examples.

This is the first species of the genus known to occur as far north as Korea, the other members being mostly from the Indo-Malayan region.

Eucycla violacea, sp. n.

Length, 3–3·3 mm.; *breadth*, 2·8–3 mm.

Body rounded, strongly convex. Head with the vertex deep-bluish, the interantennal space and clypeus more or less piceous, labrum brown; prothorax bluish-black or black, the anterior margin violaceous or piceous; elytra violaceous. Antennae with the six basal segments brown, the two following black and the three apical ones pale yellow, with the apex of the last one blackish. Underside piceous, the posterior femora bluish-violaceous and the abdomen fulvous.

Head: vertex finely and sparsely punctate; clypeus cuneiform, slightly depressed in the middle; antennae with the first sgement long and club-shaped and equal in length to the four following together, second thicker but almost equal in length to the third, fourth a little shorter than third and as long as the fifth, sixth shorter than the rest, the remainder thicker with the last segment pointed at the apex. Prothorax four times as broad as long, sides straight, base with a rounded lobe in the middle, surface finely and rather closely punctate. Scutellum smooth. Elytra punctate-striate, each having nine rows on the disc and a short scutellar row, interstices very finely and sparsely punctate; marginal space broad, with two rows of strong punctures in the anterior half not lying in a furrow, the punctures become smaller at the apex; epipleura concave. Underside sparsely covered with hairs.

Hab. Larat (*F. Muir*).

Described from six examples.

Eucycla javana, sp. n.

Length, 2·7 mm.; *breadth*, 2·5 mm.

Body rounded, very convex. Colour of head, prothorax and underside reddish, with the middle of the pronotum stained bluish; elytra piceous with the apex reddish.

Head with the vertex sparsely and finely punctate. First segment of the antennae as long as the three following together, second thicker and much longer than the third which is slightly longer than the fourth. Prothorax closely punctate. Elytra punctate-striate, interstices with some scattered punctures which are slightly smaller than those on the rows; marginal space broad, sparsely punctate; with a row of fine punctures placed in the furrow near the lateral margin and close to it another row of deep punctures distantly placed.

Hab. Java (*Bowring*).

Described from one example.

Eucycla nigromaculata, sp. n.

Length, 2·5–3 mm.; *breadth*, 2·4–2·7 mm.

Body hemispherical. Colour reddish-brown, the four apical segments of the antennae blackish with the apex of the last one brown. Elytra with a basal transverse band which is broadened towards the lateral margin and covering the humerus, this band is prolonged longitudinally along the suture to below the middle where it meets another transverse band.

Head with a few fine punctures on the vertex. Antennae extending to the middle of elytra, first segment equal in length to the three following together, second thicker but scarcely longer than the third or fourth; fourth, fifth and sixth equal in length, the rest thickened, each longer than the sixth. Prothorax rather closely punctate, sides almost straight, base bisinuate on each side and with a lobe in the middle. Elytra punctate-striate, interstices sparsely punctate.

Hab. Java (*Bowring*).
Described from two examples.

Eucycla bella, sp. n.

Length, 3 mm.

Body rounded, very convex. General colour of head, prothorax and underside reddish-brown with base of pronotum black. Antennae black, except the first segment which is testaceous and the two following which are deep reddish-brown. Scutellum piceous. Elytra pale yellow, the suture black posteriorly. Each elytron with three small, rounded, black spots: one placed on the humerus, the other two in a transverse line at the middle. There is another spot common to both elytra placed immediately below the scutellum.

Head inclined in front. Antennae with the first segment as long as the four following together, second much thicker and slightly longer than third, fourth shorter than third but longer than fifth, the rest thickened, each longer than broad. Pronotum rather strongly and closely punctate, somewhat narrowed in front; at the anterior angles the margins are thickened. Elytra regularly punctate in nine and a half rows, the punctures hardly larger than those on the pronotum, interstices and marginal space smooth, with some very fine punctures.

Hab. Ceylon (*A. Rutherford*).
Described from one example.

Hespera nigra, sp. n.

Length, 3·5 mm.

Body oblong. Completely black, with the antennae somewhat piceous and tinged with brown on the underside of the three or four basal segments. Pubescence yellowish-white.

Head less densely pubescent than the pronotum or elytra, vertex strongly granulate, frontal tubercles transverse, rather well developed. Antennae extending to the middle of the elytra, first segment long and club-shaped, second a little shorter than the third, fourth longer than the third, the following segments almost equal to each other in length, the apical one pointed. Prothorax subquadrate, slightly broader than long, sides slightly rounded, posterior angles widely rounded, surface rather convex, coarsely granulate. Elytra broader than prothorax, rather strongly punctate, the punctures not very large but deep, mingled with much smaller ones.

Hab. Sarawak (*J. E. A. Lewis*); Mt. Matang (*G. E. Bryant*).
Described from four examples.

This species is closely allied to *H. punctata*, Chen, and *H. krishna*, Maulik, but may be distinguished by the broader body and the deeper elytral punctures.

Hespera suturalis, sp. n.

Length, 2·5–3 mm.

General colour of the body testaceous, except the seven apical segments of the antennae which are brownish-black; head brownish-yellow, sometimes with a piceous spot on the

vertex; the suture narrowly blackish-brown and the metasternum piceous. Pubescence silvery-white.

Head pubescent, finely granulate; frontal tubercles transverse, rather distinctly raised. Antennae filiform, a little shorter than the body, first segment club-shaped, not much thickened, second distinctly shorter than third, fourth longer than the third, the fifth to ninth almost equal to each other in length, each slightly longer than the fourth, the two apical ones shorter. Prothorax subquadrate, finely granulate, sides almost straight, somewhat widened near the anterior angles, posterior angles obliquely rounded. Elytra as finely granulate as the pronotum.

Hab. N. W. Rhodesia: N. of Broken Hill (*H. C. Dollman*).

Described from twenty-two examples.

This species may be distinguished from the other members of the genus by the coloration of the body, the pubescence and the extremely fine granulation of the elytra and pronotum.

Hespera nigricornis, sp. n.

Length. 3·3 mm.

Body oblong. Colour blackish, with the three basal segments of the antennae and the legs more or less tinged with piceous. Pubescence yellowish-grey.

Head pubescent, vertex granulate, frontal tubercles rather distinct. Antennae stout, first segment club-shaped, second smaller and shorter than the third, the rest thickened, almost equal to each other in length, hardly longer than the third. Prothorax subquadrate, sides nearly straight, surface rather finely granulate punctate. Elytra broader at base than prothorax, granulate punctate.

Hab. N. W. Rhodesia: Mwengwa (*H. C. Dollman*).

Described from five examples.

Closely allied to *H. intermedia,* Jac., from which it may be easily distinguished by the darker coloured body, the stouter antennae in which the segments are strongly thickened with the second segment only slightly shorter than the third, whereas in *H. intermedia,* the antennae are filiform with the second segment much shorter than the third.

A NEW SPECIES OF THE GENUS *XANTHACIURA,* HENDEL (DIPT., TRYPETIDAE)

By John R. Malloch.

This genus was the subject of a recent note by Bates * in which he briefly gave the characters for its recognition. Unfortunately several of the cited characters do not hold good throughout the genus, and one of them is entirely erroneous, the third wing-vein being always more or less haired basally above and not bare. The number of pairs of infraorbital bristles is not three in every species, there being sometimes but two pairs, and though the upper orbitals are normally in two pairs, with the uppermost pair much smaller than the other, this is a rather general rule throughout the family and in some specimens

* 1933, *Psyche,* **40**: 55.

I find that there is either no upper pair or these are microscopic. Some months ago I submitted a paper * for publication in which I included a revisional key to the species known to me, three of which are from North America, and in this I gave the same synonymy as given by Bates as far as *Tetraciura*, Hendel, and *Xanthaciura*, Hendel, are concerned.

Below I describe a new species that has been turned over to me for identification since the completion of my previous manuscript.

Xanthaciura major, sp. n.

♂, ♀. *Head* testaceous yellow, upper half of occiput black, frons very slightly shining, the triangle and vertical margin glossy; frontal bristles except the upper reclinate pair dark brown, the latter yellow and about half as long as the lower pair. Ocellar bristles in transverse line with the anterior ocellus. Anterior eye facets enlarged as usual. *Thorax* glossy black, the pleura with very slight greyish dusting, the hairs and bristles pale, the latter more brownish than the hairs; apical pair of scutellars not over one-third as long as the basal pair. *Legs* testaceous yellow, the hairs and bristles all yellow, no exceptional

Fig. 1.—*Xanthaciura major*, sp. n., wing.

armature or structures present. *Abdomen* glossy black, lateral edges of second and third tergites narrowly brown, the hairs dark except on first tergite. *Wings* (fig. 1) with the typical brownish-black markings of the genus, but differing from all the known species in having the outer one of the two hyaline wedge-shaped marks in the second posterior cell curved forward into the first posterior cell and ending against the third vein on a line drawn from the upper extremity of the outer cross-vein to the tip of the second vein. In addition to this character the first posterior cell has one small hyaline mark against the fourth vein about midway between the cross-veins, there is no hyaline dot proximad of the inner cross-vein, the costal cell is almost entirely dark, there are two brown rays of the dark colour extending to or almost to the hind margin of the wing from the apical half of the discal cell in addition to the one over the outer cross-vein and no ray on the basal half of that cell. Third vein with some stiff widely separated hairs to inner cross-vein on upperside and some similar but less extensive hairs on lower side as in most of the congeneric species.

Halteres yellow.

Holotype ♂, allotype, and four paratypes, Peru: S. Eulalia, 26.xi.1932, No. 634–32 (*Wille Lamar*).

Cat. No. 50129, U.S. Nat. Mus.

* 1933, *Dipt. Patagonia*, **6** (4): 266.

ON TWO NEW BRACONID GENERA FROM INDIA (HYM.)

By D. S. Wilkinson, F.R.E.S.

(*Imperial Institute of Entomology.*)

The material that I had before me as the subject of this short paper was bred at the Forest Research Institute, Dehra Dun, save for one or two specimens from Dr. Ferrière's private collection that were clearly of the same species and which it seemed a pity not to include.

A great deal of biological data with regard to these particular parasites and their hosts has, it seems, been collected at Dehra Dun, and awaits publication. The identification of the parasites was a matter of some urgency therefore, and consequently this must be my excuse for presenting these descriptions in this disconnected form.

As regards the illustrations, the excellent photographs of the wings were taken by Mr. M. E. Mosely, while the line drawings are, even without reference to the signature, obviously the work of that incomparable artist, Engel Terzi; and my thanks are due to both these gentlemen for the assistance they have thus rendered me.

Cedria, gen. n.

Subfamily Pambolinae, but winged; possibly referable to the Hecabolinae. Head transverse; the flagellum in both sexes 11-jointed, submoniliform, and considerably shorter than the combined length of head, thorax, and abdomen. Thorax: mesonotum with distinct, but not deeply impressed notauli; the scutellar sulcus in the form of two large foveae; the propodeon areated. Wings (fig. 2, *a*) complete; the fore-wings with two cubital cells, the 2nd transverse cubital wanting; the nervulus present; the radial cell reaching apex of wing, closed; the cubital vein complete (save possibly towards apical margin), at least very definitely present to half-way between the junction of the cubital with the recurrent and the apical margin of the wing; the recurrent inserted into the 2nd cubital cell; the hind-wing of the males without stigma. Abdomen with the three basal tergites in the form of a more or less flattened carapace (fig. 1), which completely hides the remaining segments; the 1st and 2nd tergites articulated, with the 1st suture profound; 2nd suture present only as a broad, shallow impression.

Genotype: *Cedria paradoxa*, sp. n.

Being unquestionably a Cyclostome, and having its occiput margined and its fore-wings with but two cubital cells, this new genus can only be referable to either the Pambolinae or the Hecabolinae; and of these two, despite the presence of completely formed wings in both sexes, the subfamily Pambolinae is clearly the one that should be chosen for its reception.

In the Pambolinae, this new genus could only run to *Pambolus*, Hal., from which it is of course easily distinguishable through, *inter alia*, the presence of wings in the female, and on the conformation of the carapace. In the Hecabolinae, it could well run to *Monolexis*, Förster; the carapaceiform nature of the basal tergites, however, is sufficient to separate it from this or any genus in this latter subfamily.

Dr. Ch. Ferrière, to whom I have shown the available material, and who has been so good as to read the above description, agrees with me as to the position of this genus.

Cedria paradoxa, sp. n.

♀♂. Red testaceous; the ovipositor sheaths, and about the seven apical joints of the antennae, darkened or black; stigma and wing-veins red-brown; wings lightly, but distinctly, infumated, with a stronger patch of infumation along both sides of the 1st abscissa of the radial; stigma with a basal cloud.

♀♂. *Head* with only minute, widely spaced punctation; the flagellum about as long as the combined length of the head and thorax. *Thorax:* mesonotum with some coarse punctation and with a straight, fine, median longitudinal carina running from its extreme

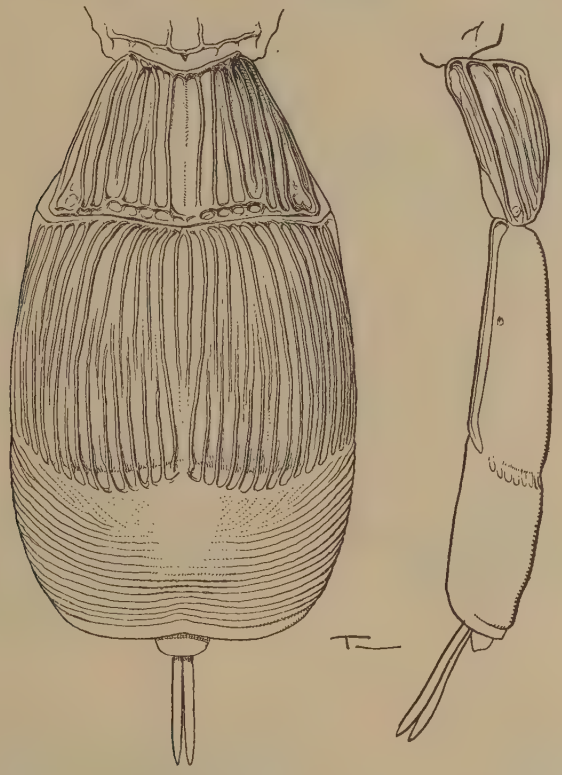


Fig. 1.—*Cedria paradoxa*, gen. et sp. n.; dorsal and lateral view of the carapace.

anterior margin to the junction of the straight notauli, which occurs immediately anteriorly to the scutellar sulcus; propodeon almost throughout its length with a large pentagonal areola whose length is twice its greatest breadth, this latter being just slightly before the middle and whence costulae are emitted which, quickly branching to form other areae, are very short. *Abdomen:* the length of the carapace (fig. 1) equal to the combined length of head and thorax; 1st tergite with its apical breadth very definitely greater than its median length (34 : 24), and its surface, as that of the 2nd tergite, throughout with well-marked, well-spaced, longitudinal carinae, but otherwise without sculpture or punctation; 2nd tergite more or less rectangular, with its median length less than its apical breadth (35 : 45), where is the greatest breadth of the carapace; the shallow indication of the 2nd

suture bisinuate, with the carinae of the 2nd tergite extending on to it completely, even sometimes just beyond it; 3rd tergite shorter than 2nd, but rather longer than the visible portions of the ovipositor sheaths (20 : 35 : 18), medianly at apex slightly emarginate, its surface regularly aciculated save for an entirely smooth median basal area; these aciculations are obliquely placed in each lateral third, and join transversely across the median third—they would seem to be the obsolete continuation of the extreme lateral carinae of the 2nd tergite.

Length : ♀, 2·25 mm.; ♂, 1·5–1·75 mm.

India: Dehra Dun, United Provinces, 1 ♀, 8.xii.1927, 1 ♂, 11.xii.1927, 3 ♀♀ (one the *type*), 14.ix.1933, 4 ♂♂, 27.ix.1933, 1 ♀, 10.xi.1933 (*S. N. Chatterjee*).

Type deposited in the British Museum.

Host. The pair dated 1927 is labelled to have been bred from the Pyralid, *Hapalia machaeralis*, Walk., defoliating *Tectona grandis*; the three females dated ix.1933, from the Pyralid, *Glyphodes* (*Margaronia*) *pyloalis*, Walk.; the four males of 1933, from *Hapalia machaeralis*; and the remaining female, from a Pyralid defoliating *Callicarpa arborea*. I am informed, further, by Mr. Gardner that this parasite has also another host, namely the Pyralid, *Pyrausta coclesalis*, Walk.

This new species has been known and referred to for some little time both as *Monolexis* sp., and under the manuscript name of *Miocolus dubius*, Ollenbach.

Sbeitla, gen. n.

Subfamily Doryctinae. Frons flat; the whole of the vertex slightly swollen, with the anterior ocellus perpendicular on the perpendicular anterior face of this swelling. Prothorax without spines; mesonotum and scutellum much flattened, and, together with the anterior half of the propodeon, virtually on the same plane; the mesonotum with

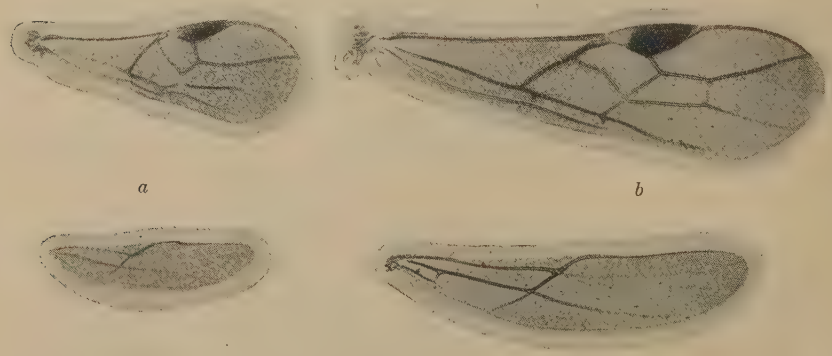


Fig. 2.—Wings of (*a*) *Cedria paradoxa* and (*b*) *Sbeitla furax*, genn. et spp. n. (× 20).

Note.—In the figures of the wings of *S. furax* no attention should be paid either to the extent or depth of the infumation.

crenulate notauli; the propodeon areated. Fore-wings (fig. 2, *b*) with the inner side of the stigma rather shorter than the outer; the 1st abscissa of the radial shorter than the 2nd; the 2nd and 3rd abscissae of both the radial and cubital veins normal, not broadened; the basal half of the 1st abscissa of the cubital bent downwards out of its normal course, the upper portion of the basal vein consequently very long; the recurrent received just

into the 2nd cubital cell; the nervulus very strongly postfurcal; the nervus parallelus interstitial; the basal vein very strong, virtually straight; hind-wings with the radial cell not divided. Hind coxae short oval with the lower anterior angle somewhat produced, without teeth save for some very minute serration below; the hind femora very strongly enlarged (fig. 3), much as in the Chalcidoid genus *Brachymeria* but relatively not so strongly toothed along the lower margin, the teeth long but rather weak; the hind tibiae as in *Brachymeria* distinctly decurved and on their lower surface flattened for almost their entire length, the flattened area keeled on both sides; the four posterior tarsi considerably shorter than their respective tibiae; the front tarsus about as long as its tibia; the basal joint of the hind tarsus laterally somewhat compressed, shorter than the combined length of the remaining joints; all claws simple. First tergite at the most twice as long as broad; the 2nd suture very fine; the 2nd and 3rd tergites without transverse or oblique furrows; the ovipositor long.

GENOTYPE : *Sbeitla furax*, sp. n.

Undoubtedly a Doryctine with its cubical head and with the fore-wings with three cubital cells, this new genus is distinctive if only on the form of its hind legs. In Szépligeti's key to the DORYCTINAE in the Genera Insectorum *Sbeitla* will not run satisfactorily, and neither will it compare with the descriptions of any of the somewhat numerous genera that have subsequently been described in this subfamily.

Sbeitla furax, sp. n.

♀. Fuscous; the head and mesonotum often red; the antennae, mouth-parts, four anterior legs completely, the hind legs (save for the femora and the apical half of the tibiae), the tegulae, 2nd tergite and portions of the 3rd, the ovipositor sheaths (save for

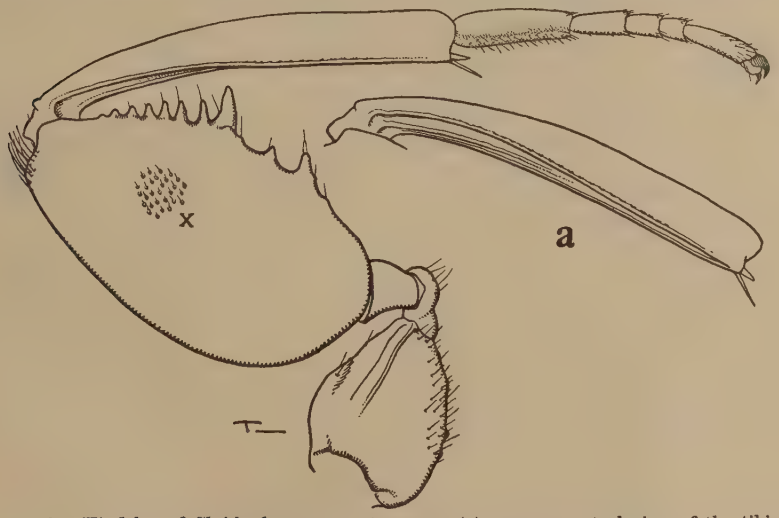


FIG. 3.—Hind leg of *Sbeitla furax*, gen. et sp. n.; (*a*) a more ventral view of the tibia, (*x*) a portion of the punctation of the femur, to show strength and density.

the apical third), the ventrites to considerable extent, red testaceous; wings slightly, evenly infumated throughout, their veins red; stigma fuscous, but its basal fourth pale.

♂. Agrees well enough with the colour description for the female, save that the pigmentation is not so strong.

Both sexes could be equally well described as having the propodeon and 1st tergite very strongly darkened or black, with the remainder of the parts varying between light testaceous and dark red testaceous.

♀♂. *Head:* face rugose; vertex coriaceous; occiput transversely striate; posterior ocelli rather nearer to the eyes than to each other; flagellar joints 24–29, the first joint stronger than the remainder. *Thorax:* mesonotum coriaceous, save in the middle posteriorly where there is a reticulately rugose area into which the notauli lead; the scutellar sulcus arcuate, with from eight to ten crenulations that are longer than broad; disc of scutellum punctate; propodeon strongly reticulate, with in its basal fourth a median longitudinal carina, which then bifurcates to form a long, narrow areola; costulae present, their length greater than the breadth of the areola. *Wings, figured* (fig. 2, *b*). *Legs* (fig. 3): hind coxae aciculated above, punctated below; hind femora regularly punctate. *Abdomen:* 1st tergite with an entirely smooth lunule on the apical margin that occupies one-third of the breadth of the margin, otherwise strongly reticulate throughout, truncate, its apical angles right-angles and the apical margin straight, in the ♀ with its sides virtually straight and nearly parallel, the basal breadth rather less than the apical breadth, which is three-fourths the median length (26 : 30 : 40), in the ♂ parallel-sided with its length approaching twice its breadth (32 : 18); the apical angles of this tergite are depressed, the depressed area, which occupies each lateral third of the margin, being delimitated by a short oblique sulcus; 2nd tergite with some weak reticulation and striation in the median basal half that is clearly present in the females but obsolete in the males, otherwise entirely smooth and shining as are the succeeding tergites; ovipositor sheaths longer than abdomen, about equal to the combined length of head and abdomen.

Length: ♀, 3·5–4·5 mm.; ♂, 3·0–3·5 mm.

India: Ferozepur, 2 ♀♀, 18.ix.1924 (*type*), 23.x.1924; Etawah, U.P., 1 ♀, 5.ix.1924, 1 ♂, 25.ix.1924, 1 ♂, 10.x.1924 (*G. D. Bahsin*). Philippine Islands: Basilan, 1 ♀, 2 ♂♂, xii.1927 (*Böttcher*); Agunan, 2 ♀♀, vi.1915 (*Böttcher*).

Type deposited in the British Museum.

Host. The two females from Ferozepur are labelled "*ex* Tents I.P. Pins wood" and "*ex* I.P. Pins wood" respectively, this possibly being the official method of saying "*ex* wooden pins of Indian-pattern tents"; the remaining specimens from India are labelled only "ex *Acacia arabica*." The Philippine material is without host record.

This new species has been known for some little time under the manuscript name *Pseudohormius bicarinatus*, Ollenbach. It is a species that would appear to be common and widely distributed. I am informed that the Forest Research Institute has a very large series, taken in Karachi, the Punjab, the United Provinces, and the Central Provinces.

A NEW *MACROPHTHALMOTHRIPS* (THYSANOPTERA) FROM TANGANYIKA

By J. Douglas Hood.

(*University of Rochester, New York.*)

The species described below was collected by Dr. C. B. Williams, and is described at this time because it extends the known distribution of the genus to another continent. The species previously known have been described from Australia, Malaya, Paraguay, Trinidad, and Panama.

The figures are from camera lucida drawings by Miss Helen E. Rearwin.

Macrophthalmothrips pulchellus, sp. n.

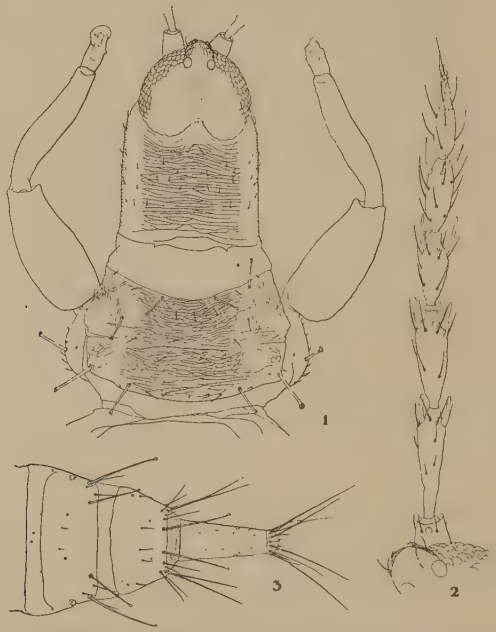
♀ (macropterous).—Length about 1·9 mm. (distended, 2·5 mm.). Colour brown, with red subhypodermal pigmentation: by *reflected* light and in freshly mounted specimens which have not remained too long in preservative, with a prominent latero-dorsal white stripe extending posteriorly from the eye to base of head and traversing the prothorax, where it is much wider than on head; pterothorax with a white spot on mesonotum and white at sides of metanotum and behind it; abdomen with segment 1 largely white and with a white spot at posterior angles of terga 2–6, these latter abdominal spots successively smaller posteriorly; by *transmitted* light, or in specimens which have remained longer in preservative, these white markings are not evident, but the transparent areas of the cuticula are pale yellowish; remainder of head blackish-brown, much darker than the nearly rectangular area at middle of prothorax and somewhat darker than metanotum, the latter scarcely as dark as metathoracic episternum and epimeron; abdomen increasingly darker to terga 7 and 8, which are blackish-brown, proximal terga darkest at sides cephalad of the white areas, tergum 9 yellowish-brown with sides and distal third blackish-brown; tube dark blackish-brown in proximal two-fifths, brown beyond; legs with all coxae and femora and the fore trochanters blackish-brown, the other trochanters yellowish-brown; fore tibiae pale yellow, with a small brown cloud proximally and another more or less separate brown cloud in second and third fifths (mostly at sides); middle tibiae pale clear yellow in a little less than distal third and yellowish-brown in nearly proximal fourth, the intervening portion blackish-brown; hind tibiae pale clear yellow in distal fourth and proximal fifth, with the middle portion blackish-brown; tarsi yellow with dark cups, the middle and hind pairs lightly shaded with brownish; wings light yellowish-brown, with a dark brown median streak; antennae with segment I dark blackish-brown, II light brown with dark blackish-brown pedicel and extreme sides and middle of distal half nearly yellow, III light brown but paler in pedicel and darker in constricted apex, IV with pedicel light brown, the remainder and all of V–VIII blackish-brown but paler than fore femora; major setae of entire body colourless, save only those on tube, which are light brown.

Head (fig. 1) about 1·56 times as long as greatest width (which is at base), and 1·9 times as long as width across eyes, the minutely serrulate cheeks almost parallel in proximal three-fifths * and curving to eyes (more abruptly anteriorly) in distal portion, the vertex produced, overhanging, bearing the partially obscured anterior ocellus below its apex, and with five pairs of strong, brown, medially-curved setae in front of posterior ocelli, and with a number of raised longitudinal darker lines of sculpture; dorsal surface of head, in the dark median area which is a little narrower than width across eyes, closely transversely striate with anastomosing lines, the pale vitta on each side free of sculpture; postocular setae not visible in the type, dorsum of head and the cheeks with a few minute setae, additional setae probably present between the eyes. Eyes normal to the genus, *i.e.*, very large, finely facetted, and nearly touching at middle of dorsal aspect of head and also beneath vertex, reniform as seen from above. Ocelli of posterior pair with diameter hardly 0·7 their interval. Antennae (fig. 2) with all of segment I and proximal half of II covered by eyes, form and chaetotaxy of segments well shown in illustration, segment VIII fully separated from VII by a complete suture. Mouth-cone long and pointed, extending well on to metasternum.

Prothorax (fig. 1) about 2·34 times as wide across coxae as median length of pronotum, the last scarcely half as long as head, with a deep transverse apodemal furrow across middle, and in the central dark area heavily and closely striate with dark anastomosing lines, the two pale areas almost free of sculpture; episternum and epimeron not

* The illustration of the head was made after the latter had become slightly widened basally by cover-glass pressure.

differentiated; all usual setae present, stout, dilated at apex. Pterothorax slightly wider than prothorax; mesonotum with transverse anastomosing lines spaced much as on pronotum but less heavy, those at middle of anterior half with their posterior margins asperate, the reticles with numerous granules and dashes forming a minute anastomosis within each; metanotum with nearly longitudinal dark lines in basal portion, spaced much as on pronotum and slightly converging posteriorly but not anastomosing except distally, where they form a few polygons, its entire surface covered with minute stipple-like granules. Legs slender, not long, fore tarsus with a minute downwardly-directed tooth on inner surface at apex of first segment. Wings of normal form; subbasal setae colourless, dilated at



Macrophthalmothrips pulchellus, sp. n., fig. 1.—Head and prothorax, ♀, holotype; all setae and sculpture omitted from the region between eyes (because of the opacity of the specimen) and from appendages. Head and thorax very slightly flattened by cover-glass pressure; see description for exact proportions and measurements; fig. 2.—Right antenna, ♀, holotype; fig. 3.—Segments VIII–X of abdomen, ♀, holotype; sculpture omitted.

apex, about equal to those on anterior margin of pronotum; posterior margin with nine accessory hairs.

Abdomen equal in width to pterothorax, long and moderately slender; terga, excepting the first and the last three or four, with transverse anastomosing lines which are obsolescent at middle and very distinct laterally, especially just in front of the pale spots, where they are darkest and distinctly asperate; tube (fig. 3) about 0·44 as long as head, about 2·34 times as long as greatest subbasal width, which is about 1·74 times the apical width, sides perfectly straight; major abdominal setae mostly knobbed; lateral pair on segment 7 pointed and 120 μ long, homologous ones on 6 and 8 knobbed and respectively 92 μ and 108 μ, lateral pair on 9 pointed and 120 μ, dorsal pair on 9 knobbed and 98 μ, terminal setae pointed and 140 μ.

Measurements of holotypes (♀): Length about 1·91 mm. (distended, 2·54 mm.); head, length 0·324 mm., greatest width (at base) 0·208 mm.; diameter of posterior ocelli 0·017 mm., interval 0·026 mm.; eyes, length 0·140 mm., width 0·083 mm.; prothorax, length 0·154 mm., width (including coxae) 0·360 mm.; pterothorax, greatest width 0·366 mm.; abdomen, greatest width 0·366 mm.; tube, length 0·143 mm.; width near base 0·061 mm., at apex 0·035 mm. Setae: anterior marginal 40 μ, anterior lateral 45 μ, midlateral 37 μ, epimeral 66 μ, posterior marginal 48 μ, coxal 49 μ, terminal (on tube) 140 μ.

Antennal segments:	3	4	5	6	7	8
Length (μ):	97	90	68	66	46	34
Width (μ):	27	30	26	27	22	12

Tanganyika Territory: Amani. Described from one female, 27.i.1928 (*Dr. C. B. Williams*), on dead branches [Hood No. 460].

The dark brown femora distinguish this species readily from the American ones. In the Malayan *quadricolor*, segments 3 to 6 of the antennae are yellow basally, while the third segment is not only differently shaped but also much longer and a trifle more slender (130 $\mu \times 25\,\mu$ as compared with 97 $\mu \times 27\,\mu$). The genotype, *M. argus*, from Australia, resembles the present species in that it lacks the yellow colour at the bases of antennal segments 5 and 6 and has the third segment of about the same size and proportions; but for it no dorsal variegation of any sort is described, the hind tibiae are not yellow at base, and the head is said to be twice as long as wide.

SOME NEW SPECIES AND VARIETIES OF ORIENTAL HUMBLE-BEES (HYM. BOMBIDAE)

By O. W. Richards, M.A., F.R.E.S.

Bombus oculatus, Frison (1933).

There is a male in the collection of the British Museum (India: Punjab, Dalhousie, Oct. '17, *N. B. Kinnear*) with the same pattern as that described by Frison. A second male in the Wilson Saunders coll., Oxford University Museum (India), differs in having the second tergite with entirely white pubescence.

The following workers belong to this species but differ from the type-form in their colour-pattern. It is possible that in this species the workers always differ in pattern from the male, but more material is required to settle this point.

B. oculatus var. **haemorrhous,** var. n.

Worker. The hairs are black; those of the whole thorax, except a few black hairs under the wings, white; of tergites 1–2 purplish red, of 3 black, of 4–6 dark red; those of the legs and venter dark; of mid trochanters red-tinged. Wings darkened. Hairs of medium length, even.

Length, 14 mm.; breadth between the tegulae, 4·5 mm.

Mandibles with almost no sulcus and no incisura. Malar space distinctly longer than broad, as long as the second and third segments of antennae together, unpunctured (longer than in an equal-sized worker of *B. lapidarius*, L., but still not one and a half times longer than broad). Labrum with flattened tubercles, with large, smooth, outer surface; furrow

not very deep, rather broader than a tubercle; lamella with its edge curved, half as broad as labrum. Clypeus not much swollen, little punctured except for a few large ones round the shallow apical depressions. Antennae with third segment shorter than fourth and fifth together, only a little more than one and a half times longer than the fifth. Eyes normal, ocelli just within the supraorbital line, separated by nearly three times their diameter from eyes. Occiput between compound eyes and ocelli smooth and shining but with moderately numerous punctures near the eyes. Posterior distal angle of mid basitarsus not acute. Dorsal distal angle of hind tibiae not produced, surface of tibia not alutaceous. Hind basitarsus thinly clothed with pubescence, distal dorsal angle a little produced. Sixth sternite not keeled. Tergite 5 rather dull, finely and, except on narrow discal area, closely punctured.

Type, worker. India: Punjab, Dalhousie, 7 July, '06 (*H. W. Barrow*) (British Museum). Paratype, workers, 1 Punjab (British Museum); 1 Kashmir, 5–10,000 ft. (U.S. Nat. Mus.).

Frison * places this species in the subgenus *Sibiricobombus* because the eyes of the male are strongly swollen. In my opinion it must be placed in *Lapidariobombus*, Vogt. The enlargement of the male eyes occurs (to a greater or lesser extent) in four other groups of *Bombus* and cannot alone be taken as an indication of relationship. The section *Boopobombus* erected by Frison (1927) for species whose males have enlarged eyes is, in my opinion, an unnatural assemblage.

The sagittae of *B. oculatus* are very similar to those of *B. lapidarius*, L., whereas in *Sibiricobombus* the apical hook is always broadly rounded. The seventh and eighth sternites, as figured by Frison are intermediate between those of *B. lapidarius* and *B. niveatus*, Krchb. (*Sibiricobombus*), but the seventh sternite is definitely nearer that of *B. lapidarius*. In *Sibiricobombus*, also, the malar space is always very long and the antennal segments of the male are more or less lengthened.

B. waterstoni, sp. n.

♀. The hairs are black; mesonotum with a narrow, anterior, white-mixed collar; mesopleuron with narrow, anterior, white-mixed band, extending to the sternum; scutellum with some white hairs; tergite 3 with whitish red hairs, 4–6 with white ones. Venter with dark hairs, those of sternites 4–5 paler. Wings subhyaline. Hairs of medium length, even.

Length, 23 mm.; breadth between the tegulae, 7·5 mm.

Mandibles with no sulcus, incisura very weak. Malar space subquadrate, if anything a little longer than broad, nearly as long as antennal segments three and four together, unpunctured. Labrum with tubercles rather convex, closely but rather finely punctured throughout, furrow broader than a tubercle; lamella hidden. Clypeus rather swollen, with scattered, small punctures, apical depressions not at all defined, closely punctured, the punctures being of two sizes, the larger ones not being very coarse. Antennae with third segment elongate, more than two and a half times as long as broad, only a little shorter than the fourth and fifth segments together; fifth segment a very little longer than the fourth, one and a half times as long as broad. Eyes normal; ocelli situated just below the supraorbital line, separated by two and a half times their diameter from the eyes. Vertex with large shining spaces round the ocelli, with a few punctures between them and the eyes. Mid basitarsus not spinosely produced. Distal dorsal angle of hind tibiae not produced, outer surface rather dull, distinctly alutaceous. Hind basitarsus densely pubescent. Fifth tergite very shining with sparse, fine punctures. Sixth tergite with a bare, convex area, as in *B. lapidarius*, L. Sixth sternite not keeled.

* I believe that Dr. Frison was misled by me. I examined his specimen but omitted to extract the genitalia.

Type, ♀. India: "Himalayas," Smith coll. (British Museum).

This species superficially resembles *B. funerarius*, Sm., with which it was confused in the British Museum collection, but it belongs to the subgenus *Lapidariobombus*, Vogt. Frison (1933) has described another species, *B. grahami* (subgenus *Alpigenobombus*, Skor.) which has the same colour-pattern.

B. parthenius, sp. n.

♀. The hairs are pale ochreous yellow; most of the longer hairs of the head (except on clypeus), a few hairs on the mesonotum and mesopleura, black; tergite 1 black-mixed; sides of tergites black-mixed; a few hairs on the disc of tergite 2, most of 3 and the whole of 4–5, pale orange-red; tergite 6 with black hairs; venter pale haired; mid trochanter with short, very bright orange hairs; tibiae and tarsi light piceous, with reddish hairs. A few hairs beneath the fore femora black. Wings infuscate at the apex. Hairs long and uneven.

Length, 18 mm.; breadth between the tegulae, 6 mm.

Mandibles with practically no sulcus and a very weak incisura. Malar space a little longer than broad, rather longer than the second and third antennal segments together, unpunctured. Labrum with flattened tubercles, heavily punctured on their inner side, outwardly flat and smooth; furrow narrow, about half the width of a tubercle; lamella small and strongly rounded. Clypeus a little swollen, smooth and shining, with sparse, scattered, small punctures, depressions hardly indicated but containing three or four large punctures and no small ones. Antennae with third segment about twice as long as broad, distinctly longer than the fifth which is one and a third times as long as broad and a little longer than the fourth which is about quadrate. Occiput with a large shining space round the ocelli, with very few punctures; even the part of the occiput behind the compound eyes distinctly shining. Mid basitarsus rather long, dorsal edge gentle curved, dorsal distal angle a rounded right angle. Hind tibiae with dorsal distal angle not produced, outer surface not alutaceous. Hind basitarsus with dorsal distal angle roundly produced, surface moderately pubescent. Fifth tergite shining, finely punctured, on disc sparsely, on sides moderately closely. Sixth tergite simple, disc bare. Sixth sternite not keeled.

Type, ♀. Sikkim, Ari, 7000 ft., May '94 (*C. T. Bingham*) (British Museum). Paratypes:—2 females and two specimens which are either females or large workers, Sikkim, Runjit Valley, 10,000 ft., May '94 (*C. T. Bingham*); one female or large worker, the same locality, April '94 (*C. T. Bingham*); one female Tibet, Yatung, 4500 ft. (*A. E. Hobson*). All in the collection of the British Museum.

It is highly probable that this species belongs to the subgenus *Pratobombus*, Vogt.

B. parthenius var. **luteipes**, var. n.

Worker. Structurally similar to *B. parthenius*, the tibiae and tarsi and even the femora similarly light piceous, but differing as follows in colour pattern:—yellow pubescence brighter, especially on the abdomen; no black hairs on the mesopleura; abdomen with hairs entirely bright yellow except a few black hairs on the sides of tergites 3, 4 and 5; tergite 6 with pale hairs. Hairs rather long and uneven.

Length, 12 mm.; breadth between the tegulae, 3 mm.

Type, worker. Sikkim, Gnatong, 12,500 ft., May '94 (*C. T. Bingham*) (British Museum).

This specimen was identified by Bingham as *B. flavescens*, Sm., but in that species the abdomen is entirely yellow haired and the pubescence is shorter and more even.

B. parthenius var. **picipes,** var. n.

Resembles the variety *luteipes* but legs very dark piceous, almost black and the abdominal tergites with even fewer black hairs.

Type, worker. China: Shense Province, Taipaishan, 24 July '05 (British Museum). Dr. T. H. Frison kindly allowed me to examine a worker (China: Szechuen, 7–14 Aug. 24, *D. C. Graham*) which appears to be almost identical except that the abdominal tergites have no black hairs.

B. fletcheri, sp. n.

♀. The hairs are black; the short ones of the head pale. Mesonotum and upper two-thirds of the mesopleura with white ones, lower part of the pleura black-mixed, becoming black on the sternum; tergite 1 with white hairs, 2 pale yellowish-white, black-mixed at sides and on disc at apex; 3 black, 4–6 pale yellowish-white. Legs black-haired; venter dark-haired with many pale ones intermixed, especially towards the apex. Wings dark brown. Hairs of moderate length, rather uneven on abdomen.

Length, 18 mm.; breadth between the tegulae, 7 mm.

Mandibles with no sulcus, incisura weak. Malar space about quadrate, if anything a little longer than broad, a little longer than segments 2 + 3 of antennae. Labrum with tubercles flattened, strongly and confluently punctured near furrow, smooth, flat and shining at sides; furrow broad and deep, two-thirds the breadth of a tubercle; lamella small and rounded, one-third as wide as labrum. Clypeus very convex, strongly impressed at apex, impressions not quite meeting on disc, with moderately numerous, large punctures and many fine ones which are more numerous dorsally. Ocelli separated by two and a half times their diameter from eyes; vertex between ocelli and eyes smooth and shining over a large area. Antennae with third segment two and a half times as long as broad, not quite as long as segments four and five together; segment five one and a third times as long as broad, a little longer than four, which is hardly more than quadrate. Disc of mesothorax smooth and unpunctured. Mid basitarsus with distal dorsal angle rounded. Hind tibiae with dorsal distal angle not produced, outer surface smooth and shining, hardly alutaceous. Hind basitarsus with dorsal distal angle about rectangular, pubescence of outer surface moderately dense. Abdominal tergites four and five smooth and shining, practically unpunctured. Last tergite with bristles on almost its whole surface, basal part smooth and shining. Sixth sternite not keeled.

Type, ♀. India: Kashmir, Gulmarg, 7 June, '31 (*T. B. Fletcher*) (British Museum).

This species belongs to the subgenus *Pratobombus*, but is distinct from any described species in its dark wings and peculiar colour-pattern.

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NOTES ON ODONATA (CORDULIIDAE) OF THE NEOTROPICAL REGION

By J. Cowley, F.R.E.S.

The following series of notes are based on the interesting collections of Peruvian Odonata received from Dr. Paul Martin, of Lima, together with material from Bolivia (*F. Steinbach*), British Honduras (*J. J. White*) and various localities (Staudinger and Bang-Haas). Corduliidae are notoriously rare in collections, and out of about 700 specimens received from Dr. Martin there is only one Corduline, a new species of *Aeschnosoma*; *Gomphomacromia paradoxa*, Brauer, is also recorded for the first time from Peru, *G. fallax*, McL., having been the only Corduline hitherto known from that country.

All five neotropical genera of Corduliidae, *Neocordulia*, Selys, *Gomphomacromia*, Brauer, *Aeschnosoma*, Selys, *Paracordulia*, Mart., and *Rialla*, Nav., are confined to the region; *Dorocordulia*, Needh., is a nearctic genus, but *D. errans* has been described by Calvert (1909) from Brazil, with the suggestion that the locality is erroneous. Central America appears to be surprisingly ill-provided with members of this group, and the genera of the neotropical-nearctic transitional area (Baja California, Upper Mexico, Florida) are all either nearctic (*Epicordulia*, *Tetragoneuria*), holarctic (*Somatochlora*) or are found in all regions except the neotropical (*Macromia*).

Gomphomacromia, Brauer (1864).

Needham (1933) has recently described a Mexican species of this genus and has given a key to the species, which unfortunately omits *chilensis*, Martin, and *nodisticta*, Ris; the key given by Ris (1928) also omits *chilensis*. The key below includes all the known species:

1(2). No pale dorsal spots on abdominal segments 4–7 (8 with small yellow dorsal spots, 9 and 10 mostly yellow) . . . . *chilensis*, Martin (1921). Central Chile.

2(1). Pale dorsal spots present on abdominal segments 4–7 . . . . . 3.

3(6). 5–6 postnodals of the second series before the pterostigma; antehumeral (mesepisternal) stripe small and ill-defined or wanting; no pale dorsal spots on abdominal segment 8 of male . . . . . 4.

4(5). Abdominal segments 9 and 10 yellow above. (♀ unknown) *mexicana*, Needham (1933). Mexico.

5(4). Abdominal segments 9 and 10 black above . . *fallax*, McLachlan (1881). Ecuador, Peru, Brazil, Bolivia.

6(3). 3–4 postnodals of the second series before the pterostigma (rarely 5, and if so only in one wing); antehumeral (mesepisternal) stripe large, well-defined; two pale dorsal spots on abdominal segment 8 of male . 7.

7(8). First lateral thoracic stripe divided into two spots, one large and dorsal to the metastigma, the other small and ventral to the metastigma *paradoxa*, Brauer (1864). South-west Peru, Central and South Chile, Patagonia.

8(7). First lateral thoracic stripe not divided into two spots . . . . . 9.

9(10). First lateral thoracic stripe broad, not confined to the metepisternum, but also covering a large part of the mesepimeron *paradoxa* f. *tincta*, Navás (1918). Central Chile.

10(9). First lateral thoracic stripe narrow, confined to the metepisternum
nodisticta, Ris (1928).
North-west Argentina (Catamarca).

For further details and figures see the papers of Navás (1918), Ris (1918 and 1928), Martin (1921) and Needham (1933).

Gomphomacromia paradoxa f. *tincta*, Nav. (1918).

Ris (1928) has already suggested that his *G. paradoxa* (forma), from Limache, Central Chile, may be the same as *G. paradoxa* var. *tincta*, Nav.; but Navás's type-locality (Marga Marga) was unknown to him, and also Navás did not describe the colour-pattern of the thorax and abdomen. Valle de Marga-Marga is south-east of Quilpué, Prov. Valparaiso, and therefore also in Central Chile, an additional reason for adopting Ris's suggestion.

Gomphomacromia paradoxa, Brauer (1864).

1 ♂, 1 ♀, Marcapata, Peru; 1 ♀, Chile. (Staudinger.)

The Peruvian specimens agree very well with the descriptions and figures and certainly belong to this species. Marcapata is on the north-east slope of the Andes de Hapo, Prov. Quispicanchis, Dep. Cuzco. The female from Chile has two small indistinct yellow dorsal spots on abdominal segment 8, and the yellow wing-coloration is as described by Navás (1918) for his var. *effusa*, but in all other respects it agrees with typical *paradoxa*; the var. *effusa* does not seem to be sufficiently distinct to require a name.

♂ abd. 27, hw. 28; ♀ abd. 28, hw. 25 (Marcapata), 26 (Chile).

Aeschnosoma, Selys (1871).

The new species of this genus described below necessitates an alteration in the generic characters: the cubito-anal space of the hind-wing is usually free (crossed in both hind-wings of *peruviana*, sp. n.).

Tillyard (1910) in his revision of *Synthemis* remarks on the variability of the venation of that genus, which frequently has irregular triangles; he therefore suggests that *Pentathemis membranulata*, Karsch, may be an *Aeschnosoma* with an irregular triangle, in which case one would expect not only to find other venational abnormalities, but also that the triangles are differently formed in each fore-wing. Martin (1906) has already figured the right wings of *P. membranulata*, and the venation certainly agrees extremely closely with that of *Aeschnosoma, except for the triangle of the fore-wing*. Through the kind offices of Dr. Schmidt, I have received an excellent photograph of the unique type of *P. membranulata* in the Berlin Museum; the triangles of both fore-wings are similar, and the only major difference between the right and the left wings is that the subtriangle of the left fore-wing is two-celled (three-celled in the right fore-wing); there is nothing to lead one to suppose that the venation is in any way irregular or deformed. There seems no doubt that *Pentathemis* must be retained as a distinct genus.

Key to the species of Aeschnosoma.

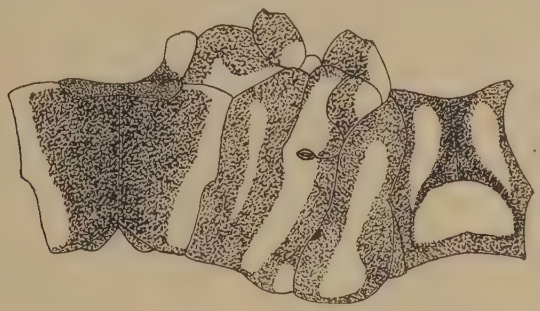
1(2). 11 antenodals and 5 postnodals in the fore-wing; size smaller (abd. 30 mm., hw. 27 mm.). (Triangle of fore-wing three-celled, of hind-wing two-celled. ♀ unknown) . . . . . *rustica*, Selys (1871).
Bahia; Dutch Guiana.

2(1). More than 11 antenodals and 5 postnodals in the fore-wing; size larger . 3.
3(6). 14–17 antenodals in the fore-wing; triangle of fore-wing three-celled, of hind-wing two-celled (rarely three-celled); thorax with four lateral pale stripes . . . . . 4.
4(5). Hind-wing with two cubito-anal cross-veins, the distal one forming the basal side of the subtriangle; abd. 38·5 mm., hw. 38–39 mm. (♂ unknown) . . . . . **peruviana,** sp. n. Huallaga basin, Peru.
5(4). Hind-wing with only one cubito-anal cross-vein, forming the basal side of the subtriangle; abd. 33–37 mm., hw. 33–37 mm. *forcipula*, Selys (1871). Para; Upper Amazon, Brazil.
6(3). 17–18 antenodals in the fore-wing; triangle of fore-wing two-celled, of hind-wing four-celled; thorax with three lateral pale stripes. (Abd. 45 mm., hw. 41 mm. ♂ unknown) . . . . . *elegans*, Selys (1871). Amazon.

Aeschnosoma peruviana, sp. n.

♂ unknown.

♀. Head: labium dull yellow; frontal and dorsal parts of head and eyes brown; antennae long, the basal segment thick, dark brown, the distal segments filiform, brown, becoming lighter apically. Prothorax pale brown; synthorax (fig. 1) brown, with a



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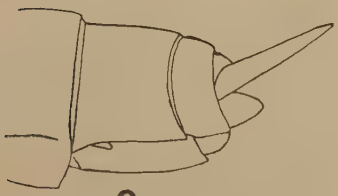

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Figs. 1-2.—*Aeschnosoma peruviana*, sp. n., type ♀.—fig. 1, diagram of thoracic colour-pattern (brown and yellow); fig. 2, lateral view of vulvar scale and anal appendages.

small black spot at about the centre of the second lateral suture, and the following stripes and spots yellow: mesepisternum with a stripe against the humeral suture and continuing on to the mesinfraepisternum; mesepimeron with a narrow median stripe, not reaching the dorsal and ventral margins; metepisternum with a small spot at the dorsal

end of the second lateral suture, and with a broad stripe against the first lateral suture, widened at the metastigma, bounded ventrally by the metinfraepisternum, which has a ventral spot; metepimeron with a median stripe, enlarged at each end; ventral surface of synthorax pale brown, with two apical virgules and a basal semicircular spot yellow. Notum and wing-bases brown. Legs pale brown basally, becoming darker apically and dorsally, the coxae with a ventral yellow spot; tibial and tarsal spines black; tarsal claws brown.

Wings hyaline, the bases yellow, extending in the fore-wing to the level of the second antenodal, in the hind-wing to the first antenodal, most developed in the subcostal and cubito-anal spaces; membranule grey, two cells long in the hind-wing; pterostigma dark grey, covering two cells. 16 antenodals and 7 postnodals fore-wing, 10 antenodals and 9 postnodals hind-wing; the second antenodal coinciding with the arculus; 3–4 cross-veins in supratriangle of fore-wing, 1 in hind-wing; triangle of fore-wing three-celled, of hind-wing two-celled; subtriangle of fore-wing three-celled, of hind-wing free; 3 cubito-anal cross-veins in fore-wing, 2 in hind-wing (including basal side of subtriangle); a supplementary bridge cross-vein present in fore-wing, absent in hind-wing.

Abdomen brown, each segment darker apically and with a small ill-defined black dorsal area at the apex; segment two laterally with a rounded yellow basal spot and a small yellow apical streak. Vulvar scale (fig. 2) entire, slightly longer than segment 9, provided at the base with a very short lateral process, which is black apically. Anal appendages black, widened rather abruptly beyond the base, then tapering to a point; three times as long as segment 10, separated by a triangular brown supra-anal lamina, which is slightly longer than segment 10.

Abd. 38·5 + 1·5 mm., fw. 39 mm., hw. 38–39 mm., pt. 2 mm.

Type : 1 ♀. Peru : Rioja, Prov. Moyobamba, Dep. San Martín (*Dr. P. Martin*).

The specimen is evidently teneral and not in good condition, the abdomen having been compressed laterally, but the colour-pattern of the thorax is very distinct. The species is nearest to *A. forcipula*, but differs from the latter in the yellow spots on the thorax and second abdominal segments (not mentioned in Selys' (1871) description of *forcipula*), the longer anal appendages, and the possession of an extra cubito-anal cross-vein in the hind-wing. Rioja lies at an altitude of 848 metres between two tributaries of the Rio Mayo, itself a tributary of the Rio Huallaga.

Paracordulia tomentosa (Fabr. 1775).

Walker (1925) has identified *Somatochlora villosa* (Ramb. 1842) with *P. tomentosa*; as confirmation the figures of the male anal appendages of a specimen of *P. tomentosa* from Marga Marga, given by Navás (1918), agree with those of *S. villosa* given by Martin (1906). The subtriangle of the hind-wings is not regularly absent in this species.

Rialla, Navás (1915).

According to Navás (1917) this genus differs from *Somatochlora* in having no subtriangle in the hind-wing, and from *Paracordulia* in having the triangle of the hind-wing crossed. Ris (1918) suggests that the only known species, *R. membranata*, Nav. (1915), is *S. villosa* (= *P. tomentosa*); Martin (1921) gives as the distribution of *P. tomentosa* " Chili " and of *R. membranata* " Chili, Argentine," so that it appears he was able to distinguish the two species. The genus *Rialla* should be retained until further material is available to settle this point.

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ON A NEW SPECIES OF *TARGIONIA* (COCCIDAE) FROM RUSSIA

By E. E. Green, F.R.E.S.

Targionia slavonica, sp. n.

Scale of female greyish or ochreous white, opaque: circular or broadly ovate, moderately convex: exuviae eccentric, often situated close to anterior margin, bright

Fig. 1.—*Targionia slavonica*, sp. n., pygidium, × 220.

orange-red, concealed in fresh examples but exposed later. The scales are usually distorted by crowding, but isolated examples have a diameter of from 1·75 to 2 mm.

Adult female broadly rounded in front, tapering abruptly behind: cephalothorax and

posterior extremity densely sclerose: intermediate abdominal area membranous: spiracles without parastigmatic pores. Pygidium without perivulvar pores: broadly triangular: median trullae large and prominent, the distal margin entire, sloping outwardly, separated by approximately their own width: 1st lateral trullae similar but smaller, the distal margin slightly excavate, separated from the median trullae by a deep incision: 2nd lateral trullae similar but much smaller, often dentiform: interval between median trullae with two very short setae: a short spiniform seta on the outer side of each median trulla: a pair of longer setae exterior to each lateral trulla and a single seta on each side nearer the base: anal orifice at approximately $\frac{1}{5}$th of the distance between the extremity and the base: the latter bounded by four transverse, sclerous bars: with two vertical sclerous bars extending from the base half-way to the 2nd pair of lateral trullae: marginal area with many circular pores. Length of body 1·25 to 1·50 mm.; breadth averaging 1 mm.

Ex coll. *A. Kiritshenko.* There appears to be some confusion as to the food-plant of this species. It was originally sent to me as *Aspidiotus transcaspiensis* of Morrison (from which it is amply distinct) and was labelled "on *Populus*, Turkmenistan, Aschabad." Later, when Prof. Kiritshenko's attention was drawn to the mistaken identification, he suggested that there might have been an error in the label and that this insect may have been taken on *Haloxylon.* However, the material received consists of a small branch, the character of which is far more like that of *Populus* or *Salix* than of any species of *Haloxylon.*

Supplementary Note.

Fresh material, recently received from Dr. Kiritshenko since the above description was in print, has necessitated a modification of the statement that there are no perivulvar pores. Though this is the fact in a few cases, I now find that traces of four groups can usually be distinguished. The average number of pores in the upper groups consists of 1 only, though examples have been observed with numbers running up to 5. The lower groups average 2 pores in each, but groups of 3, 4 and 6 have been observed. In a few examples one or both groups on one side may be missing. In many examples individual pores appear to be degenerate and functionless. It would seem, therefore, that this is an instance of a species that is in process of a gradual elimination of the normal groups of perivulvar pores, and may be an index of what has possibly occurred in the case of *Aspidiotus lataniae*, Sign., and *A.* (*Hemiberlesia*) *camelliae*, Sign. I have drawn attention to a similar instance (1928, *Ann. Mag. Nat. Hist.*, (10) **1**: 374) of a racial form (var. *marocanus*) of *Aspidiotus lenticularis*, Lindgr., that is distinguished from the type solely by the almost complete suppression of the usual perivulvar pores.

In the case of the species here described as *Targionia slavonica*, the general characters of the pygidium (more particularly in the absence of fimbriate squames) agree more closely with those of the genus *Targionia* than with those of typical *Aspidiotus.*

The present material is from "Samarkand, Usbekistan." It was again wrongly assumed to represent *Aspidiotus transcaspiensis* and was again labelled "on *Populus* sp." So we may now presume that this is the true food-plant of the species.

SOME NOTES ON THE NOMENCLATURE OF PALAEARCTIC AND AFRICAN RHOPALOCERA

By Francis Hemming, C.B.E., F.R.E.S.

The following notes on the nomenclature of certain species of Palaearctic Rhopalocera have been made in the course of recent work.

Satyridae.

1. **Eumenis statilinus eurytion,** nom. n. pro *Satyrus statilinus*, Hufn. form *intermedia*, Verity (1911, Bull. Soc. ent. ital., **42** : 270), which is invalid, as it is a homonym of *Satyrus intermedius*, Gr.-Gr. (1890, in Romanoff, Mém. Lép., **4** : 480). Verity's *intermedia*, though originally named as a form only, is, in fact, the subspecies of *statilinus*, Hufn., found in the neighbourhood of Florence.

2. **Eumenis fidia minerva,** nom. n. pro *Satyrus fidia intermedia*, Rothschild (1917, Novit. Zool., Tring, **24** : 107), which is invalid, as it is also a homonym of *Satyrus intermedius*, Gr.-Gr., 1890.

3. **Maniola bathseba davidiana,** nom. n. pro *Papilio pasiphae*, Esp., 1781 (Die Schmett. **1** (Bd. 2) Forts. Tagschmett. : 99), which is invalid, as it is a homonym of *Papilio pasiphae*, Cram., 1775. Esper stated (on p. 99) that his *pasiphae* came from Paris, but on p. 130 (*nota a*) he corrected this to "Antibes in der Provence" and "Pyrenaen." Antibes should, therefore, be regarded as the type locality of *davidiana*, Hemming. The oldest name of any subspecies of this species is *Papilio bathseba*, Fab., 1793 (Ent. Syst., **3** (1) : 235) from North Africa, and this name should be adopted as the name of the collective species.

4. **Maniola aphrodite,** nom. n. pro *Papilio ida*, Esp., [1784] (Die Schmett. **1** (Bd. 2) Forts. Tagschmett. : 184), which is invalid, as it is a homonym of *Papilio ida*, Cram., 1775. The type locality of *ida*, Esp. (and therefore of *aphrodite*, Hemming) is the Pyrenees.

Nymphalidae.

5. **Argynnis pales alethea,** ssp. n.

This name is required for the insect described and figured by Esper ([1780], Die Schmett. **1** (Bd. 2) Forts. Tagschmett. : 36 pl. 56, fig. 5 ♂) as *Papilio arsilache*, Esp. var. This insect has since become widely known as *arsilache*, Esp., but this use of the name cannot possibly be justified, as *Papilio arsilache* Esp. (*ibid.* : 35, pl. 56, fig. 4 ♂) is an entirely different subspecies of *pales*, Schiff. It was described from a specimen taken near Vienna, and is identical with nominotypical *pales*, Schiff., to which, therefore, *arsilache*, Esp., falls as a synonym. The specimen that Esper called "*P. arsilache* var." came from Neustadt-an-der-Aisch in Lower Franconia, which is, therefore, the type locality of *alethea*, Hemming.

6. **Argynnis titania julia,** nom. n. pro *Argynnis amathusia*, Esp. form *altaica*, Seitz (1909, Grossschmett. Erde, **1** : 232), which is invalid, as it is a homonym of *Argynnis pales*, Schiff. var. *altaica*, Gr.-Gr. (1893, Hor. Soc. ent. ross., **27** : 128). As I have pointed out (1933, Entomologist, **66** : 276) *Papilio titania*, Esp., 1793, is the oldest valid name for the collective species formerly known as *Argynnis amathusia* (Esp., [1784]).

7. **Argynnis cydippe persephone,** nom. n. pro *Argynnis adippe*, Linn. race *pallida*, Evans (1912, J. Bombay Nat. Hist. Soc., **21** : 582), which is invalid,

as it is a homonym of *Argynnis freija*, Thunberg var. *pallida*, Elwes (1899, Trans. Ent. Soc. Lond. **1899** : 338).

8. **Melitaea cinxia deva,** nom. n. pro *Melitaea cinxia*, Linn. form *sicula*, Ragusa (1919, Nat. sicil., **23** (7/12) : 149) which is invalid, as it is a homonym of *Melitaea athalia*, Rott. form *sicula*, Turati (1915, Atti. Soc. ital. Sci. nat., **53** (3/4) : 600).

9. **Melitaea asteroidea evadne,** nom. n. pro *Melitaea asteroidea*, Stgr var. *pallida*, Stgr (1901, in Staudinger & Rebel, Cat. Lep. pal. Faun., **1** : 33), which is invalid, as it is a homonym of *Melitaea pallida*, Edw. (1864, Proc. Ent. Soc. Philad., **2** : 505).

Lycaenidae.

10. **Lycaeides ismenias letitia,** nom. n. pro *Lycaena argus*, Linn. var. *ligurica*, Oberthür (1910, Ét. Lép. comp., **4** : 201), which is invalid, as it is a homonym of *Lycaena arion*, Linn. var. *ligurica*, Wagner (1904, Soc. ent., **19** : 1). Though described by Oberthür as a var. (i.e. subspecies) of *Lycaena argus* (Linn.), *ligurica*, Oberthür is, in fact, a subspecies of the insect originally described as *Polyommatus ismenias*, Meigen (1829, Syst. Beschr. europ. Schmett., **2** (1) : 33), to which, therefore, it is here ascribed.

11. **Scolitantides orion athene,** nom. n. pro *Lycaena orion*, Pall. var. *ornata*, Stgr. (1892, in Romanoff, Mém. Lép., **6** : 159) which is invalid, as it is a homonym of *Lycaena astrarche*, Bergstr. ab. *ornata*, Stgr. (1892, Deuts. ent. Z. Iris. **5** : 280). Both names were published by Staudinger in 1892. I have treated the volume of *Iris* as having been published before the volume of Romanoff's *Mémoires* because the month of publication of the former is known, while that of the latter is not.

12. **Glaucopsyche alexis selene,** nom. n. pro *Lycaena alexis alpina*, Turati & Verity (1911, Bull. Soc. ent. ital., **42** : 260), which is invalid, as it is a homonym of *Lycaena argus*, Linn. var. *alpina*, Berce (1867, Faun. ent. France : 134).

13. **Vacciniina optilete medea**, nom. n. pro *Lycaena optilete*, Knoch form *uralensis*, Seitz (1909, Grossschmett. Erde, **1** : 304), which is invalid, as it is a homonym of *Lycaena arion*, Linn. var. *uralensis* (Gr.-Gr. Mss.), Elwes (1899, Trans. Ent. Soc. Lond., **1899** : 329).

14. **Lycaena hippothoë memphis,** nom. n. pro *Chrysophanus hippothoë*, Linn. form *obscura*, Courvoisier (1911, Ent. Z., **24** : 245), which is invalid, as it is a secondary homonym of *Polyommatus amphidamas*, Esp. form *obscura*, Rühl (1893, Pal. Grossschmett., **1** : 220).

Pieridae.

15. **Pieris rapae meleager,** nom. n. pro *Pieris rapae*, Linn. var. *iranica*, Le Cerf (1913, Ann. Hist. nat. Ent., **2** : 25) which is invalid, as it is a homonym of *Pieris iranica*, Bienert ([1870], Lep. Ergebnisse : 27).

16. **Euchloë cardamines sheldoni** nom. nov. pro *Euchloë cardamines*, Linn. var. *volgensis*, Sheldon (1914, Entomologist, **47** : 270), which is invalid, as it is a homonym of *Euchloë ausonia volgensis*, Krulikowsky (1897, Saratowsk Zemsk. Ned., **1897,** No. 1—2).

17. **Colias hecla palamedes,** nom. n. pro *Colias hecla*, Lef. var. *pallida*, Skinner (1892, Proc. Acad. Nat. Sci. Philad., **1892** : 156), which is invalid, as it is a homonym of *Colias erate*, Esp. ab. *pallida*, Stgr. (1861, in Stgr & Wocke, Cat. Lep. Europa's : 3).

PAPILIONIDAE.

18. **Parnassius delphius menander,** nom. n. pro *Parnassius delphius*, Ev. race *intermedia* (Gr.-Gr. Mss.), Verity (1911, Rhop. pal. : 316), which is invalid, as it is a homonym of *Parnassius intermedius*, Mén. (1855, Enum. Anim. Mus. Petr. Lep. (1) : 72).

HESPERIIDAE.

19. **Carcharodus imperator,** nom. n. pro *Papilio altheae*, Hb. ([1802], Samml. europ. Schmett., **1** pl. 90, fig. 452–3 ♀), which is invalid, as it is a homonym of *Papilio althaeae*, Esp. (1783, Die Schmett., **1** (Bd. 2) Forts. Tagschmett. : 149).

20. **Ochlodes alexandra,** nom. n. pro *Papilio sylvanus*, Esp. (1777, Die Schmett., **1** (6) pl. 36. fig. 1 ♀), which is invalid, as it is a homonym of *Papilio sylvanus*, Dru. (1773, Ill. Nat. Hist., **2** : Index & 5). The oldest name of any subspecies of this species is *Hesperia venata*, Bremer & Grey ((1852), in Motschulsky, Ét. Ent., **1** : 61). and, as I have pointed out (Hemming, 1934, in Gen. Names Brit. Ins. : 39), this should be adopted as the name for the collective species. The subspecies re-named above should, therefore, be known in future as *Ochlodes venata alexandra*, Hem.. It is the principal subspecies in Europe of *venata*, Brem. & Grey. Its type locality is Franconia.

21. **Metisella** gen. nov.*

Type. *Metisella metis* (Linn., 1764) (= *Papilio metis*, Linn., 1764).

Generic characters. I select as the generic characters of *Metisella*, Hemming, the characters given by Watson (1893, Proc. Zool. Soc., London, **1893** : 90) for *Cyclopides*, Hb. The latter is not available for *metis*, Linn., as its type is *Papilio steropes*, Schiff., 1775, a species which is not congeneric with *metis*, Linn.

* The name *Watsonia*, Tutt (1906, Brit. Butt., **1** : 191) of which *metis*, L., is the type is invalid as it is a homonym of *Watsonia*, Folin (1879, Proc. Zool. Soc. Lond., **1879** : 807).

NOTES ON SOME ORIENTAL DRAGONFLIES (ODONATA), WITH DESCRIPTION OF A NEW SPECIES

By F. F. LAIDLAW, F.R.E.S.

ZYGOPTERA.

LIBELLAGINAE.

Calocypha karschi (Kruger).

Rhinocypha karschi, Kruger, 1898, Stettin. ent. Ztg., **59** : 83–85.
„ „ Laidlaw, 1902, Proc. Zool. Soc., **1902** : 20.
„ „ *id.*, 1920, Proc. Zool. Soc., **1920** : 328.

Mr. Lieftinck has sent me a single male of this species, with an inquiry as to its generic position. A careful examination of the venation has convinced me that the species stands apart from other species of *Rhinocypha* and that it should be transferred to the genus *Calocypha* which up to the present has included only the S. Indian species *laidlawi* for which Fraser proposed it (1928, J. Bombay Nat. Hist. Soc., **32** : 457). This genus is characterised by the great degree of petiolation of the wings, the anal bridge commencing at or beyond the level of the arculus, and quite remote from the vein *ac*, whereas in other genera of the family the anal bridge begins before the level of *ac*, except in the case of *Disparocypha*, a genus in which the anal bridge is absent altogether.

It must be admitted that the two species *laidlawi* and *karschi* are not very similar in appearance, but they agree so well in the important detail of venation noted above that I believe I am fully justified in placing them in the same genus.

The distribution of *karschi*, found as it is in Malaya, Sumatra and Borneo, is not paralleled exactly by any species of *Rhinocypha*, and suggests that this species has had a different history from those of the latter genus.

I believe that the species described by Martin, *Micromerus robropictus* (Martin, 1902, Bull. Mus. Hist. nat., **8** : 508) is a synonym of the present species, but I have had no opportunity of examining Martin's type, and his description is not full.

Head : velvety black, labium white, labrum with a paired, transverse, yellow spot. Genae and a narrow line along the margins of the compound eyes, greenish-white. Frons with a pair of large yellow spots, behind these a small pair of spots of the same colour, one on either side of the posterior ocelli, and behind these again a row of three minute spots on the epicranium.

Prothorax : black, with a minute greenish-white spot, round in shape, on the dorsum of the anterior lobe, and a larger, yellow mark on the dorsum of the posterior lobe. This latter mark lies transversely, and has a minute projection from its front and back margins in the middle line. The anterior pair of coxae are marked with yellow, and there is a small, yellow mark laterally on each lobe of the prothorax.

Synthorax : black. A small but definite mesothoracic triangle of a lilac colour is present, but is not more than about a sixth of the length of the mid-dorsal carina. A large, diamond-shaped, lilac or yellow spot lies along the anterior half of the humeral suture on either side, and this mark is prolonged backward by a fine line of the same colour to the base of the first pair of wings. The upper end of the first lateral suture is marked with a very fine, yellow line, and below this a fairly broad band of yellow runs from the bases of the second pair of coxae to the base of the second pair of wings on either side. The ventral surface of the synthorax is yellow crossed by three transverse bands of black.

Wings : with a yellowish tinge and the extreme apex of the front pair finely margined with smoky brown. The distal third (about 7 mm.) of the hind pair is opaque brown-black with violet iridescence, the opacity begins abruptly, and its inner margin, which is slightly convex, runs transversely across the wing at right angles to its long axis.

Legs : black, with yellow coxae, and the bases of the femora yellowish. The tibiae, when examined in good light, are seen to have their anterior surfaces marked with chalky white. The first two pairs have the distal half so marked, whilst the third pair only show this white colouring on the distal quarter of their length. The tibiae are not dilated.

Abdomen : black, segments 2–7 with a large, brick-red mark on the dorsum of each; the extreme apex and base of each is defined by a transverse black ring. This black ring is broader on the apex of the sixth and seventh segments than on those preceding, and on the same two segments the red mark is distinctly narrower. The eighth segment has a similar red spot on the dorsum, but this extends only for about the first two-thirds of the length of the segment, and is longitudinally divided by a very fine black line along the mid-dorsal carina. There is in addition a series of yellowish-green lateral-ventral markings, extending from the first to the eighth segment. The mark on the first segment is triangular, the base of the triangle resting against the apex of the segment. On the second it is a band angled at its middle and widening posteriorly. On segments 3–6 the mark consists of a basal wedge or triangle, long and narrow, the base of the triangle resting on the basal margin of the segment, and an apical part which is a rounded spot, the whole being very like an exclamation mark (!) lying horizontally. On segments 7–8 the apical part has disappeared leaving only the basal triangle.

Anal appendages : upper pair about the length of the ninth segment, slender, tapering to a point and slightly incurved. Lower pair about half the length of the upper pair, stouter.

Length of abdomen : 14·5 + ·75 mm.

„ of hind-wing 21 mm.; greatest breadth of hind-wing 4 mm.

1 ♂. Bengkajang, near Sinkawang, W. Borneo, 21.iv.32 (*C. de Ruiter*).

Kruger's account of the species is drawn up from four males taken near Soekaranda, in Sumatra. In one of these the red marks of the dorsum of the abdomen extend only to the sixth segment; the other three have small, paired, red spots on the seventh. Martin's *robropictus*, from Borneo, the specimen here described, and a specimen from Limbang in Sarawak, sent me by the late Mr. Moulton, all have red marks on the eighth segment. This may well be a character of the Bornean race. A Malayan specimen has the mark on segment 7 longitudinally divided by the black mid-dorsal carina and that on 8 reduced to two very small spots.

AMPHIPTERYGINAE.

Devadatta podolestoides, sp. n.

This Bornean representative of this genus differs in important venational characters, as well as in the structure of the anal appendages of the male, from *D. argioides*, Selys, which ranges from Indo-China, through Siam, Malaya and Sumatra.

Notwithstanding the differences, the two species are very similar in appearance, and although I have examined Bornean specimens on several occasions I confess to having overlooked the distinction until it was pointed out to me by Mr. Lieftinck in correspondence.

Now that he has sent me a good series of examples, with a request that I should describe them, I take the opportunity of correcting my oversight, and of calling attention to the advisability of a close scrutiny of forms from widely separated areas, even when they appear at first sight quite familiar.

The Bornean species is closely related to the race which is found in the Philippine Islands, but distinguishable. On the other hand, the Sumatran examples described by Ris do not seem to differ appreciably from those from the mainland. Specimens of *argioides* from the little island of Tioman off the E. coast of Johore are sufficiently distinct, however, to deserve a name as a geographical subspecies, **tiomanensis,** subsp. n.

The following account of the Bornean species is based on the material listed below.

19 ♂♂, 4 ♀♀, collected by *Mr. Coomans de Ruiter* at Sinkawang, West Borneo, Cjn. Poteng, between Nov. 1931 and Oct. 1932. The holotype ♂ and allotype ♀ are in this series, and were collected in October and March respectively. The holotype is noted as having been collected at an altitude of 500 m. Another male of the series is from " 450 m. Zeehoogte."

5 ♂♂, 1 ♀, Kinakok river, Kinabalu, March 1929, 3300 ft. (*H. M. Pendlebury*).

2 ♂♂, WEST BORNEO : Mampawa by Andjoengan (*C. de R.*), March 1932.

For comparison I have specimens from several localities in Malaya, specimens from Pulau Tioman, and also Ris' full description of *argioides* from Sumatra (Ris, 1927, Zool. Meded., Leiden, **10** : 3, 4, fig. 1), and Williamson's figure of the venation of an example from Lower Siam (Williamson, 1904, Proc. U.S. Nat. Mus., **28** : 170, fig. 4).

The two species are very much alike, even on a fairly close scrutiny. They can be immediately distinguished by the fact that in *argioides* the cubito-anal space of both fore- and hind-wings is invariably crossed by two or even three cross-nerves in addition to the anal cross-nerve, whilst in *podolestoides* the same space is invariably uncrossed. In addition, males of the two species can easily be distinguished by differences in the anal appendages.

The type specimens are briefly described below.

♂. *Head:* Upper surfaces dark, metallic green, with a narrow line of pale colour on the back of the occiput, between the eyes. *Dorsum* of prothorax and of synthorax black, with a metallic sheen. There is a minute, linear mark of yellow just on the outer side of the humeral suture, at about its middle; and the third pair of coxae, and a small area along the lower half of the second lateral suture are also yellowish, as are the ventral surfaces. The trochanteres and femora are dull yellow, the tibiae, tarsi and ciliae brownish-black.

The *abdomen* is brownish-black, passing to matt black on the two terminal segments, whilst segments 3–8 have each of them a basal ring of primrose-yellow, interrupted mid-dorsally, and much reduced on the eighth segment.

Anal appendages * (see fig. 1) black, upper pair longer than the tenth segment, curved inward to meet each other distally, their outer surfaces carrying a number of fine denticles. Apices a little upturned. Lower pair very minute. Wings hyaline, slightly iridescent, the apex of the upper pair narrowly and rather abruptly limbate with dark brown, beyond the pterostigma.

The colouring of the allotype ♀ is very similar to that of the male, but duller. The thorax is dark brown, without any metallic sheen, the femora are dull brown, and the terminal segments of the abdomen remain very dark brown, whilst the yellow rings of segments 3–8 are also much duller than in the male. The apices of the wings on the other hand are more heavily marked with brown than is the case in the male, and the hind-wings are as fully coloured as the fore pair. Fully mature males, and females, to a less extent, have a certain amount of pruinescence on the underside of the thorax and base of abdomen.

Length of abdomen, ♂: 36 mm.; of hind-wing 29 mm. (holotype).
„ „ „ ♀: 32 mm.; „ „ „ 30 mm. (allotype).

I have further been able to compare four adult males and a single female (shrivelled) from Maloong, Basilan Is., Philippine Arch., sent me by Mr. Lieftinck. These clearly belong to *podolestoides*, but differ in minor characters, and may be treated as a subspecies, **basilanensis,** subsp. n.

I tabulate below the characters of the males of the four forms of the genus which seem to be worth recognition.

A. Cubito-anal space crossed by at least two nerves on all wings, in addition to anal crossing. Lower anal appendages about half the length of upper pair . . . . . *argioides.*

a. Apices of wings limbate, dark colouring fading gradually, without defined margin basally . . . . . *argioides argioides.*
Malaya, Sumatra, Siam, Tonkin.

b. Apices of wings abruptly limbate, limbation with sharply defined inner margin . . . . . *argioides* **tiomanensis,** subsp. n.
Pulau Tioman.

* For figure of anal appendages of *argioides* see Ris, *loc. cit.*

B. Cubito-anal space uncrossed. Lower anal appendages not one-quarter length of upper pair . . . . . **podolestoides,** sp. n.

a. Apices of fore-wings narrowly limbate, hind-wings scarcely if at all. Wings slightly iridescent. Well-marked, pale, post-occipital line on head, pulverulescence slight . . *podolestoides* **podolestoides,** subsp. n. Borneo.

b. Apices of both wings heavily limbate, fore-wings with amethyst, hind-wings with coppery iridescence. Post-occipital pale line absent, pulverulescence heavy . . . . . *podolestoides* **basilanensis,** subsp. n. Basilan.

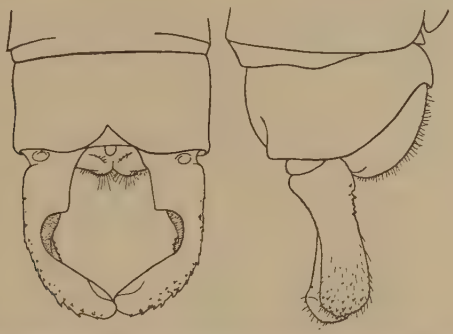


Fig. 1.—Anal appendages of *Devadatta podolestoides podolestoides,* Singkawang, Borneo.

The type specimens of the two races of *podolestoides* are in Mr. Lieftinck's collection, and that of *argioides tiomanensis* in the British Museum.

Since this note was completed, I have seen an account of a new species of *Devadatta* by Col. Fraser (1933, J. Siam Soc. (Nat. Hist. Suppl.), **9** : 129, 130). This species, named *multinervosa,* is evidently very distinct from either of the species here discussed.

For the figure of *D. podolestoides* I am indebted to Mr. Lieftinck.

THE FORMS OF *ANALACHES PUBERILIS,* KUWERT (COL., PASSALIDAE)

By John R. Dibb, F.R.E.S.

Through the kindness of M. Réné Oberthür a specimen of *Analaches puberilis,* Kuwert, labelled: (*Epilaches pubarilis,* Kuwert, Nouvelle Guinée, Amberbaki; Coll. Bruijn, 1877; Ex. Coll. Oberthür) has been sent for inclusion in the Hincks–Dibb collection of Passalidae. This example has been compared with the type of *puberilis,* Kuwert, which is in the collection of M. Oberthür.

As in the case of several other variable species of Passalidae, a number of forms of *Analaches puberilis* have apparently been described and named by different authors. Judging from the number of specimens of this species in the several collections of Passalidae to which I have been able to refer, it seems to be a common insect in New Guinea, and certainly the species most frequently

met with of the genus *Analaches*. It is only through the examination of a long series of specimens that the extent of variation within the species can be demonstrated.

Most authors subsequent to Kuwert (1) have assumed the unpunctured dorsal striae of the elytra to be a constant character, whereas, by the examination of a series of approximately one hundred specimens, the conclusion inevitably arrived at disagrees with that assumption. The examples under consideration show that the degree of puncturation of the dorsal striae is definitely variable. By arranging the whole series of specimens in a logical sequence of development, as regards the character under consideration, we commence with forms which possess impunctate dorsal striae, and at the other end of the series reach forms which have small but distinct punctures in the dorsal grooves. The specimen which has been compared with Kuwert's type is one which bears a slight degree of puncturation and compares with those forms of the series of intermediate development.

Correlated with the appearance of the elytral punctures, is a slight decrease in size and the central furrow of the thorax becomes more deeply marked. Other variable characters appear to be the length of the outer tubercles, the length of the antennal lamellae (to a small extent) and the form of the thoracic scars.

Zang (2) described *paraplesius* from a single specimen, which seems to have been a well-developed and unworn example, as he stresses the prominence of the outer angles of the supra-orbital ridges. The tubercles and ridges of the head are prone to wear to a great extent, thus adding an artificial type of variation very often present, but an important feature which must not be overlooked in the Passalidae, especially as in many species reliable specific characters have been found in the development of these tubercles and ridges.

The species *infestus*, Heller (3) is a somewhat smaller form, and *laticauda* of Zang (2) has the frontal tubercles developed to their maximum size.

Heller (3) in his valuable work which includes the Passalids of New Guinea, has tabulated the various forms and species of *Analaches* known to him, and in the table which follows I refer to the same differentiating characters, which, in my opinion, separate those forms I now consider all referable to the species *puberilis*, Kuwert.

Although Kuwert, in his works subsequent to 1891, referred to the species as *pubarilis*, his original spelling is *puberilis*.

Table of forms of Analaches puberilis, *Kuwert.*

1. Dorsal striae of elytra impunctate . . . . . *puberilis*, Kuwert.
   Dorsal striae of elytra punctured . . . . . 2.
2. Anterior angles of supra-orbital ridges prominent . . . *paraplesius*, Zang.
   Anterior angles of supra-orbital ridges not prominent . . . . . 3.
3. Thoracic scars punctured; outer tubercles reaching more than half-way towards anterior margin of labrum . . . . . *laticauda*, Zang.
   Thoracic scars impunctate; outer tubercles extending only half-way towards anterior margin of labrum . . . . . *infestus*, Heller.

References

1. Kuwert, 1891, Deuts. ent. Z., **1891** : 167; 1898, Nov. Zool. **5** : 337.
2. Zang, Deuts. ent. Z., **1905** : 238–241.
3. Heller, 1910, Abh. Ber. zool. anthr.-ethn. Mus. Dresden, **13** (3) : 20–22.

A NEW MEALYBUG (COCCIDAE) FROM COFFEE IN EAST AFRICA

By H. C. James, B.Sc., Ph.D., F.R.E.S.

Pseudococcus concavocerarii, sp. n.

Adult ♀:—The resectionary covering is a thin dusting of white wax without definite pattern; waxy tassels very slender, of uniform diameter, increasing progressively in length posteriorly; the anal, penultimate, and antepenultimate pairs of tassels may be longer than twice the length of the body; the lateral tassels may exceed in length the width of the body.

Body elongate oval; its length varies from 1·70 mm. to 4·10 mm., its breadth from 0·80 mm. to 2·20 mm.; body content dark red deepening with the age of specimens; oviparous. Perfect ovisac not observed.

The antennae 8-segmented, the segments in the following proportions (1) 20, (2) 25, (3) 23, (4) 16, (5) 16, (6) 16, (7) 15, (8) 28; a pseudo articulation of varying degrees of definiteness occurs in the middle region of the eighth segment in all specimens (53) examined; the crassate setae numbered 1 and 2 (fig. 1, *b*) are constant in occurrence and relative position.

Legs perfect; claws without denticle; translucent pores present on the outer aspects of the distal thirds of the hind femora, (fig. 1, *d*) and on the outer aspects of the hind tibiae; ungual digitules terminate in oval knobs, the tarsals not knobbed. Both pairs of dorsal ostioles distinct and triangular pores tend to segregate near their lips; ventral cicatrice approximately oval.

Rostrum dimerous, second segment much the longer; seventeen pairs of cerarii with the following average number of spines per cerarius (1) 3, (2) 4, (3) 3, (4) 2, (5) 2, (6) 2, (7) 3, (8) 2, (9) 2, (10) 2, (11) 2, (12) 2, (13) 2, (14) 2, (15) 2, (16) 2, (17) 2; occasionally a cerarius in the middle region of the body is reduced to one spine or its position is marked only by auxiliary setae; only one pair of inter-antennal cerarii; the cerarian spines of the penultimate and last pairs of cerarii arise from the floors of dermal depressions whose walls are chitinised and studded with triangular pores; (fig. 1, *c*) the paranal lobes and the derm around the penultimate pair of cerarii chitinised; the spines of the remaining cerarii smaller, subequal in size or those of the intermediate cerarii slightly smaller, not situated in dermal depressions, and with only slight indications of chitinisation in the derm around their bases; the triangular pores are somewhat crowded around the cerarii and they may number as few as six around an intermediate cerarius, but much more frequently the number lies between twenty and thirty; anteriorly and posteriorly the number of triangular pores associated with each cerarius may be as high as forty and less than twenty have not been observed; auxiliary setae almost always present and varying in number from one to five, the numbers three and four being most common.

The posterior pair of spiracles larger than the anterior pair; pores occur at the inner extremity of all the spiracles (fig. 1, *e*).

Dermal pores of four types: (1) the triangular * pores already referred to which occur in varying numbers all over the derm but are more numerous on the dorsum than on the venter; (2) circular multilocular pores which are confined to the venter in the region of the last four or five abdominal segments and are especially numerous around the genital aperture; (3) small circular ducts occurring in varying number all over the derm but most numerous in the posterior ventral abdominal region; (4) large circular ducts (fig. 1, *f*)

* The term "triangular" is here applied to pores the lumina of which are incompletely divided into three loculi; the term "trilocular" is reserved for pores in which the subdivision into three loculi is complete.

of which one, or much more rarely two, is almost invariably present near each cerarius; a few occur without apparent order in the median area of the derm; one or two short setae occur adjacent to the apertures of these ducts (fig. 1, *a*).

Fig. 1.—*a*. The posterior segments of the abdomen, × 222; *b*. The terminal segment of an antenna, × 143, nos. 1 and 2 indicate crassate setae of taxonomic importance; *c*. Optical section of penultimate and last cerarius, × 320; *d*. Outer aspect of hind-leg, × 201; *e*. A posterior spiracle, × 450; *f*. Optical section of a large circular dermal duct, × 600.

Derm setae short and very scanty on the dorsum and varying up to 5 μ in length; ventrally longer and more numerous especially in the cephalic and posterior abdominal regions and varying up to 16 μ.

Anal ring of the normal pseudococcine type with a double row of pores on each half; anal ring setae stouter and longer than the anal lobe setae.

KENYA COLONY: Kitale.

TANGANYIKA TERRITORY: Bukoba. On foliage and green stems of *Coffea arabica*.

Type slides deposited in the British Museum.

The larvae and puparia of the coccidivorous Agromyzid, *Leucopella africana*, Mall., were found among specimens of this mealybug.

NEUE UND ALTE BOMBYLIIDEN (DIPTERA)

Von S. J. PARAMONOW.

(*Kiew, Zoologisches Museum der Ukrainischen Akademie der Wissenschaften.*)

Legnotomyia persica, sp. n.

♀. Der *L. trichorhoea*, Loew, sehr ähnlich, doch unterscheidet sie sich sofort durch eine etwas andere Flügelzeichnung. Sie ist ganz gleichmässig von der Spitze der Marginalzelle bis zur unteren basalen Ecke der 2. Hinterrandzelle; nach aussen von dieser Linie wird die Färbung allmählich schwächer (bei *L. trichorhoea* ist die Grenze der Zeichnung scharf, der Spitzenteil der Marginalzelle, die Spitzenhälfte der 1. Hinterrandzelle, die ganze 2. Hinterrandzelle, die Axillar- und Analzelle sind durchsichtig). Die Ausbiegung der 2. Längsader vor der Spitze ist schwächer als bei *L. trichorhoea*. Die Adern sind gelb oder gelbbräunlich, während bei *L. trichorhoea* sie ganz schwarz sind. Der Hinterkopf, die Brustseiten und der Vorderrand des Thoraxrückens sind sehr deutlich grau bestäubt (bei *L. trichorhoea* sind sie ganz unbestäubt). Vom Vorderrand des Thoraxrückens ziehen sich bis zur Mitte desselben zwei breite, sich scharf verjüngende, keilförmige, bestäubte Streifen; die Bestäubung an den Seiten, am Hinterrand und an den Brustseiten ist etwas schwächer entwickelt. Alles übrige fast wie bei *L. trichorhoea*.

Körperlänge 7·5 mm., Flügellänge 7·5 mm.

2 ♀♀; 24.iii.1904, PERSIA: Kulichan, Arabistan (*Zarudny*) und 15.iv.1914, MESOPOTAMIA: flum. Gengiz (*Nesterov*).

Typus in der Sammlung des Zoolog. Museums der Akademie der Wissenschaften in Leningrad.

Anmerkung. Die Grenze zwischen den Gattungen *Legnotomyia* und *Psiatholasius* ist sehr undeutlich, es wird zweckmässiger sein, diese Gattungen zu vereinigen.

Cyllenia marginata, Loew.

In der Sammlung des Zoologischen Museums der Akademie in Leningrad befindet sich ein ♀ von TRANSCASPIA: Tshuli, monts. Kopet-Dag, 6-8. v. (*A. Hohlbeck*). Der Beschreibung von Loew kann man folgendes beifügen. Die Breite des Scheitels ist fast $\frac{1}{3}$ der Kopfbreite gleich (bei *C. maculata* deutlich schmäler als $\frac{1}{3}$). Der Ocellenhöcker ist bei *C. maculata* 4 mal, bei dieser Art

fast 5 mal, schmäler als der Scheitel. Bei *C. maculata* ist der Spitzenteil der 1. Submarginalzelle schmäler als die 2. Submarginalzelle, bei dieser Art umgekehrt. Bei meinem Exemplar befindet sich auf dem linken Flügel eine sehr merkwürdige Abnormität: es sind daselbst nur zwei Submarginalzellen; der basale Teil des oberen Artes der 3. Längsader fehlt hier gänzlich. Diese Abnormität wirft Licht auf die Entstehung des Flügelgeäders bei dieser Gattung. Man kann das Geäder folgenderweise betrachten—die 3. Längsader ist hier einfach, die 2. Längsader ist gegabelt. Diese Ansicht kann man durch eine andere Tatsache bestätigen—bei einem Exemplar der *C.* sp. habe ich eine ebensolche Abnormität auf beiden Flügeln in ganz ähnlich ausgeprägter Weise gefunden. Von diesem Standpunkt ist der basale Teil des oberen Astes der 3. Längsader bei dieser Gattung nur eine überzählige Querader, welche oft abwesend sein kann.

Cyllenia maculata, Latr.

In der Sammlung des Zool. Museums in Leningrad befinden sich Exemplare von: Macerata, 29.vii.1891, Italia; Sorgono, Sardinia und von Amurat, distr. Lenkoran, Talysch.

Prorachthes stackelbergi, Param. ♀.

In der Sammlung des Zoolog. Museums in Leningrad habe ich noch ein Exemplar dieser Art gefunden, welches von Perovsk, prov. Syr-Darja, 14.v.1928, (*V. Popov*) stammt.

Prorachthes beckeri, Param.

In der obenerwähnten Sammlung befinden sich 2 ♂♂ dieser Art von Sarepta, Gouv. Saratov (*Becker*) und 1 ♀ von rus Zolotoje, Gouv. Saratov (*Demokidov*), in der Sammlung von Portschinsky.

Prorachthes crassipalpis, Villnv.* ♀.

Aus der Beschreibung dieser Art ist es leicht ersichtlich, dass Herr Dr. Villeneuve die neueren Arbeiten leider ausser Acht gelassen hat.† Die Arten dieser Gattung unterscheiden sich von einander gut. Es ist höchst wahrscheinlich, dass *P. crassipalpis* nur ein Synonym von *P. longirostris*, Bezzi, darstellt. Bezzi hat seine Art (♂) aus Aegypten beschrieben, das Weibchen, welches er vor sich hatte, stammte von Algerien. Es unterscheidet sich vom Männchen in ähnlicher Weise wie dies Herr Dr. Villeneuve beschrieben hat. Nach meiner Meinung stellen beide Pärchen die beiden Geschlechter einer und derselben Art (*P. longirostris*, Bezzi) dar, also: *P. crassipalpis*, Villnv. = *P. longirostris*, Bezzi. **(Syn. n.)**

Prorachthes vespertilio, Ség. ♀.

Herr Séguy hat neuerdings (1932, Encyclop. Ent., Diptera, **6**: 126) eine neue Gattung *Dumontiella* errichtet, ohne jeden Zweifel stellt sie nur ein

* 1930, Bull. Ann. Soc. ent. Belg. **70**. Ich führe diese Beschreibung in meiner Arbeit (Trav. Mus. Zool. Kiew, **12**, im Druck) wörtlich an.

† Bezzi, 1925, Bull. Soc. ent. Égypte, **1924** : 172, Paramonow, 1926, Annu. Mus. zool. Acad. Sci. U.S.S.R., **27** : 76–87, 1 Taf.

Synonym von *Prorachthes* dar, also Synonymol: *Dumontiella*, Séguy = *Prorachthes*, Loew. **(Syn. n.)**

Die Art *Pr. vespertilio*, Ség., ist augenscheinlich eine "gute" Art. Es ist wunderbar, dass Herr Séguy kein Wort spricht über den *Prorachthes longirostris*, Bezzi.

Mariobezzia ebneri, Beck. ♂.

Die Beschreibung dieser Art, welche ich in meiner Arbeit 1929, Trav. Mus. Zool. Kiew, **6**, leider ausgelassen habe, führe ich in meiner neue Arbeit (Trav. Mus. Zool. Kiew, **12**, im Druck) wörtlich an.

Bis jetzt kennen wir keine Art in beiden Geschlechtern, daher ist es nicht klar, ob die beschriebenen Arten alle selbstständig sind. Ich führe unten eine Bestimmungstabelle der bis jetzt bekannten 5 Arten an.

Bestimmungstabelle der *Mariobezzia*-Arten der Welt.

1. Thorax und Schildchen schwarz (es sind bis jetzt nur ♂♂ dieser Gruppe bekannt) . . . . . 2.
– Thorax und Schildchen ganz gelb oder der erstere trägt drei glänzende schwarze Längsstreifen, das Schildchen hat manchmal auch schwarze Abzeichen (bis jetzt sind von dieser Gruppe nur Weibchen bekannt) . . 3.
2. Gesicht ohne dunkle Mittelstrieme. Fühler gelb. Stirn gelbbraun, ohne dunklere Flecken. Beine ganz schwarz. Hinterleib glänzend schwarzbraun mit gelben Hinterrandsäumen der Ringe. Körperlänge 3 mm. Sudan . . . . . *ebneri*, Beck., ♂.
– Gesicht mit einer schwarzen Linie unter der Mitte. Fühler schwarz. Stirn weisslich. Hinterleib schwarz, die Hinterränder des 1–3. Hinterleibssegments sind schmal weiss umsäumt, der Vorderrand des 4. rötlichbraun . . . . . *griseohirta*, Nurse, ♂.
3. Thoraxrücken ohne deutliche schwarze Längsstreifen (höchstens befinden sich bräunliche unvollständige). Schildchen gelb, durchsichtig. Hinterleib gelborangefarbig, durchsichtig. Beine gelb. Clypeus mit einer schwach entwickelten Längsstrieme auf der Mitte. Körperlänge 7 mm. Aegypten . . . . . *pellucida*, Param., ♀.
– Thoraxrücken mit 3 glänzend schwarzen Längsstreifen . . . . . 4.
4. Thoraxrücken gelb mit 3. breiten schwarzen Längsstreifen. Schildchen braungelb mit schwarzem Wurzelflecken. Brustseiten schwarz, mit gelben Flecken. Clypeus gelb, auf der Mitte mit brauner Längsstrieme. Stirn mit 2 braunen Flecken. Fühler schwarz, Wurzelglieder rötlich. Hinterleib glänzend schwarz mit gelben Hinterrandsäumen. Beine gelb, Hüften und Schenkel bis nahe zur Spitze schwarz. Flügel wie bei *ebneri*. Körperlänge 5 mm. Turkestan (Kopet-Dag) . . *lichtwardti*, Beck., ♀.
– Thoraxrücken glänzend gelb mit 3 schmalen schwarzen Längsstreifen. Schildchen und Brustseiten gelb. Clypeus ohne Mittelstrieme. Stirn mit 2 grossen schwarzen Flecken. Fühler rotgelb, drittes Glied an der Spitze braun. Hinterleib gelb mit schwarzen Vorderrandsbinden. Beine ganz gelb. Flügel gelblich; Spitze der Vorderrandader und die Vorderrandzelle schwarz Körperlänge 8–9 mm. Pers. Beludzhistan *zarudnyi*, Beck., ♀.

Gyrocraspedum pleskei, Beck. ♂ (!).

Ich habe den Typus in Leningrad gesehen; das ist kein Weibchen, sondern ein Männchen. Auch die Stellung des "Teilungsastes" in der Discoidalzelle ist von Becker nicht klar beschrieben,—die Anhangsader entspringt der Basis der 3. Hinterrandzelle und reicht bis zur Mitte derselben fast der gewöhnlichen Querader gegenüber. Der Scheitel ist deutlich kleiner als $\frac{1}{3}$ der Kopfbreite. Der Vorderrand des Flügels ist mit deutlichen, doch kleinen Wärzchen besetzt. Diese Gattung steht der Gattung *Cytherea* nahe und stellt eine sehr spezialisierte Form dar. Ich glaube, dass der stark ausgebogene Vorderrand des Flügels nur ein Geschlechtsmerkmal ist.

Semiramis punctipennis, Beck.

Typus in Leningrad. Pulvilli deutlich.

Anastoechus nigricirratus, Beck.

Ich habe die Typen in Leningrad gesehen. Ihrem Habitus nach gleicht diese Art dem *A. fuscus*, Param., sehr, doch ist sie merklich heller behaart (die Hinterleibsspitze jedoch mit ebenso sehr dichten, dunkelbraunen Haaren wie bei diesem). Die Borsten an der Spitze der Hinterschenkel sind vorhanden, doch unzahlreich. Der Scheitel ist beim ♂ verhältnismässig breit.

Anastoechus retardatus, Beck.

Ich habe die Typen gesehen. Die Exemplare sind sehr beschädigt; es ist schwer etwas neues hinzuzufügen.

Bombylius megacephalus, Portsch.

Eine sehr originelle Art. Die verhältnismässig sehr kurzen Flügel, der verlängerte Körper, die fast nicht zusammenstossenden Augen des ♂, die weissen Borsten der Beine, die Lage der gewöhnlichen Querader, welche hinter der Mitte der Discoidalzelle liegt—stellen sehr charakteristische Merkmale dar.

Exoprosopa evanescens, Beck.

Ich habe den Typus in Leningrad gesehen. Höchst wahrscheinlich stellt diese Art nur ein Synonym von *E. fallaciosa*, Loew dar. (*E. evanescens*, Beck. = *E. fallaciosa*, Loew.).

Exoprosopa clausa, Beck.

Typus in Leningrad. Diese Art unterscheidet sich von *E. bagdadensis* dadurch, dass die 1. Hinterrandzelle fast an der Spitze selbst geschlossen ist; ausserdem—der dunkle schmale Streifen längs dem Vorderrand des Flügels, von einer ebensolcher Färbung wie der dunkle Schrägstreifen, ist hier fast garnicht ausgeprägt. Eine zweifelhafte Art (nur ein einziges Exemplar). Dem Habitus nach gleicht sie der *E. bagdadensis* sehr, doch unterscheidet sie sich am besten durch die Form der 2. Hinterrandzelle: die beiden zum Flügelrand aus der Discoidalzelle verlaufenden Adern sind fast gerade und einander gleich, während bei *E. bagdadensis* die obere Ader stark gekrümmt ist.

Exoprosopa farinosa, Beck., *E. fusconotata*, Beck. und *E. sabulina*, Beck.

Die obengenannten Arten kann man von einander folgenderweise unterscheiden:

1. Eine grosse Art (Körperlänge 17 mm., Flügellange 15 mm., Flügelbreite 5 mm.). Flügel ohne deutlich bemerkbare Flecke an den Aderknotenpunkten. Die Flügelfläche ist fast ganz durchsichtig. Die Adern der Flügel gelb. Auf dem Körper befinden sich kleine ganz schwarze Haare. Die Schuppen auf dem Hinterleib oben sind ganz einfarbig . *farinosa*, Beck.
– Kleinere Arten (8–10·5 mm. lang); Flügel mit einzelnen gut bemerkbaren dunklen Flecken an den Aderknotenpunkten; die Flügelflache deutlich grau. Die Flügeladern meist schwarz . . . . . 2.
2. Stirn schwarzhaarig. Der Vorderrand des Flügels ist schmal, doch deutlich verdunkelt, die übrige Fläche einfarbig. Die Schuppen des Hinterleibs oben sind heller, auf dem 2. befinden sich auch die braunen, fast schwarzen. Beine schwarz . . . . . *fusconotata*, Beck.
– Stirn hellbehaart. Der Vorderrand des Flügels ist gelblich, die übrige Fläche deutlich grau. Die Schuppen des Hinterleibs oben gelb und weiss. Beine gelb . . . . . *sabulina*, Beck.

Hemipenthes (olim *Anthrax*) *nitidofasciatus*, Portsch. ♂.

Typus in Leningrad. Die Behaarung der Brust und des Hinterleibs ist tiefschwarz, dicht, abstehend, die helleren Haare fehlen gänzlich. Ein charakteristisches Merkmal: der starke Glanz der Oberseite des Hinterleibs (da die Beschuppung gänzlich fehlt und die Behaarung hier sehr spärlich ist). Die Discoidalzelle ist verhältnismässig kurz, deutlich kürzer als die untere Basalzelle, in der distalen Hälfte stark erweitert. Die gewöhnliche Querader vor der Mitte der Discoidalzelle. Die Analzelle ist kurz geschlossen (zufällig?). Die Beschuppung und Behaarung des Kopfes schwarz. Körperlänge 10 mm. Flügellänge 10 mm.

Hyperalonia herzi, Portsch. ♂.

Die zwei letzten Hinterleibssegmente sind durchweg silberbeschuppt. Der gelbbeschuppte Streifen auf dem 2. Segment ist in der Mitte sehr stark verengt, fast unterbrochen (die Verschmälerung ist oben und unten vorhanden), der Streifen auf dem 3. Segment ist nur hinten ausgeschnitten. Die ganze Discoidalzelle (an der Basis ebenso) ist durchsichtig, die Spitze der oberen Basalzelle ist ebenso auf einer beträchtlichen Ausdehnung durchsichtig. Die Anal- und Axillarzelle sind nur an der Basis leicht verdunkelt. Typus in Leningrad.

A NEW SPECIES OF *ARCHIPSOCUS* (PSOCOPTERA)

By J. V. Pearman, F.R.E.S.

For the opportunity of examining specimens of the insect here described I am indebted to Prof. E. W. MacBride of the Imperial College of Science. They had been sent to him in liquid by Dr. W. Fernando, Ph.D., of the University of Colombo, who had investigated the embryology of the species and found that the females were viviparous. An account of Dr. Fernando's studies will appear in the *Quarterly Journal of Microscopical Science*. It is known that many Psocids reproduce parthenogenetically, but there has been no previous record of viviparity in the order.

Archipsocus fernandi, sp. n.

Colour, ♀. Head brown with a somewhat greyish tinge, in older individuals verging on blackish. Eyes black. Antennae yellowish to pale greyish-brown. Palpi nearly colourless. Ocelli rimmed blackish on inner margins. Thorax brown. Abdominal tergites light brownish-red, the colour somewhat granular and indistinctly interrupted medially by a fine longitudinal pale line, intersegmental divisions pale yellow, terminal segment, telson and subgenital plate greyish-brown. Fore-wings greyish-brown except at apex and base, where colourless, veins indistinct. Hind-wings transparent grey, veins dark, distinct. Legs with a very slight yellow-grey tinge; claw black.

Nymph. Head and thorax brown, abdomen yellowish.

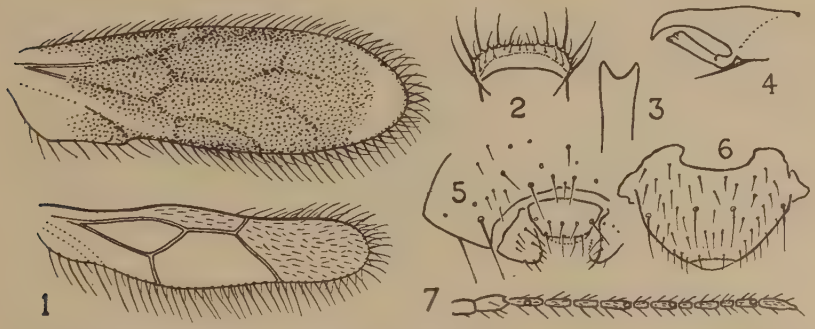
Morphology, ♀. Generally of the form shown in Dr. Enderlein's figure 50*a* (right side), 1903, *Ann. Mus. hung.*, **1**, Tab. VIII (*A. recens*), but the eyes a little larger, the antennae longer (about twice as long as the head), the prothorax narrower, the mesothorax with the divisions usual to winged Psocids, and the ciliation on body and wings stronger. Body ciliation moderately long, sub-bristly, and with some much longer setae interspersed. Pick bidentate, the incision moderately deep. Ocelli in a small triangle. Antennae, flagellar segments 5, 7 and 9 noticeably short; a sensorium at the middle of f. 1 and at the tip of f. 4, 6 and 10. Prothorax with three very long setae at each side. Legs with bristly but not very long ciliation, longest on undersides of fore and mid femora. Fore femora the broadest. Hind coxae without stridulatory organs. Tibiae with four terminal spines, little larger than neighbouring bristles but darker. In all tarsi the end segment longer than the basal one. Claw well curved at tip, and with sucker and bristle appendages. Fore-wing venation not well defined (becoming invisible in the usual microscopical mounting media, only the stigma-sac, wing-clasp and the tracheal rings of the analis then showing distinctly); venation of hind-wings, on the contrary, strong and bold. Marginal ciliation of both fore- and hind-wings mostly in a double series (most distinct on hinder margin); cilia on membrane of fore-wings generally about as long as the shorter marginal ciliation, but longer in the anal area and along the courses of radius and cubitus); apical portion of both fore- and hind-wings lightly ciliated on lower surface also. Abdomen ovoid, much distended in gravid females, somewhat pointed terminally. Telson ciliated as in fig. 5. paraprocts with two longish cilia near upper (inner) edge but without specialised sensory bristles (trichobothria of Hansen), suranal plate with colourless tip. Subgenital plate rounded, colourless at tip, with four long setae set in a row across the middle; gonopods entirely wanting; gonopore surrounded by a sclerised ring (somewhat as in *Pterodela pedicularia*, L.).

Length of body 1·25 mm.; of fore-wing 0·95 mm.; of antenna 0·55 mm.

Ceylon : Colombo, under decaying leaves on ground (*Dr. W. Fernando*).

They spin webs on the under surfaces of leaves and under one such silken covering a hundred insects of varying sizes may be found.

All the imagines examined were females and fully alate. The females of all other known species have broad spatulate gonopods; the total suppression of such organs in *fernandi* is probably a corollary of viviparity. Although the presence of the gonopore (orifice of the spermatheca) has been detected, it is not unlikely that the species may also be parthenogenetic.



Archipsocus fernandi, sp. n. 1, Wings (ciliation on membrane of fore-wing omitted); 2, prothorax; 3, pick; 4, claw; 5, last tergite and telson; 6, subgenital plate; 7, antenna.

It most nearly resembles *A. brasilianus*, Endln. (1907, *Zool. Jahrb.* (*Syst.*), **24**, 83), agreeing in the proportions of the antennal segments and in the colourless base of the fore-wings. Differs from that species by (1) slightly smaller size (fore-wing of *brasilianus* 1·15 mm.), (2) darker body colour, (3) colourless tip of fore-wing, (4) absence of gonopods, (5) no apparent tendency to brachyptery, and (6) absence of a very long hair near the tip of each paraproct.

NEW LYMANTRIIDAE (LEP.) FROM CHEKIANG AND KIANGSU, EASTERN CHINA

By C. L. Collenette, F.R.E.S.

The insects described in this paper were included in an interesting collection made by Mr. H. Höne in Eastern China, and received for determination from the Zoologisches Museum der Universität, Berlin.

The types have been returned to Berlin, and one or more paratypes, where available, have been kindly presented to the British Museum (Natural History). I hope to be able to illustrate some of these species in another paper now in preparation on the Lymantriids of Kwang-tung, S.E. China (Mell collection).

Ridgway's *Color Standards and Color Nomenclature*, 1912, has been employed in the colour descriptions.

Stilpnotia cygnopsis, sp. n.

♂. Palpus, antennal shaft and body white, pectinations of antenna pinkish-buff. Legs white, the tips of the tarsi orange-buff; on the fore and middle legs a fuscous spot proximally on the tibia and another proximally on the tarsus; on the tibia of the middle leg a further spot medially. Wings semi-hyaline, white; fringes white.

♀. Resembles the ♂.

Expanse: ♂ 33 mm., ♀♀ 38–42 mm.

1 ♂ (holotype), 1 ♀ (allotype), and 2 ♀♀ (paratypes), West Tien-mu-shan, Prov. Chekiang, 1600 metres, viii. and ix.1932.

Somewhat resembling small, semi-hyaline specimens of *Stilpnotia cygna*, Moore, without the discocellular spot, and with the apex of the fore-wing more rounded.

Caviria chrysoscela, sp. n.

♀. Palpus, antennal shaft and body white (abdomen discoloured in type), pectinations of antenna fuscous. Fore leg capucine yellow, mixed on the femur with white; middle and hind legs white, tarsi capucine yellow banded at the distal ends of the segments with white. Wings and fringes white, the surface moderately shining.

Expanse: ♀♀ 47–53 mm.

1 ♀ (holotype) and 4 ♀♀ (paratypes), West Tien-mu-shan, Prov. Chekiang, 1600 metres, iv., vii.–ix.

Characters to be noted in this species are the capucine yellow fore leg, antenna with white shaft and fuscous pectinations, and absence of spot on discocellulars.

Caviria sericea horridula, subsp. n.

Stilpnotia sericea, Moore, 1879, Lep. Coll. Atkinson, p. 45.

Moore's species, described from Darjeeling and Masuri specimens, exhibits a slight yellowish tinge to the wings, easily apparent when compared with the pure white of the present Chinese series. Moreover, in *C. sericea sericea* the surface of the fore-wing has a smoother and more silky appearance than in the Chinese insects, where the scales are rougher and more bristling. Although I have found no other constant differences in external characters, these points make it easy to separate Indian from Chinese examples.

In the genitalia the valves are asymmetrical, the shorter valve in *C. s. sericea* is narrower distally than in *C. s. horridula*, and in the former subspecies the uncus is thicker (not laterally) than in the latter.

The two fuscous spots on the upperside of the thorax posteriorly are not mentioned in Moore's original description, and in some cases are obscured by grease, but can be made out in several Indian specimens. They can be plainly seen in all specimens of the Chinese series.

Expanse: ♂♂ 36–38 mm., ♀♀ 41–51 mm.

1 ♂ (holotype), 1 ♀ (allotype), and 7 ♀♀ (paratypes), vii.1932, also 1 ♀ (paratype), xi.1932, at 1600 metres, West Tien-mu-shan, Prov. Chekiang.

Porthesia hoenei, sp. n.

♂. Palpus, head, thorax and abdomen cream-colour, anal tuft light orange-yellow. Antennal shaft whitish, pectinations pinkish-buff. Legs, pectus and venter pale pinkish-

buff. Fore-wing cartridge buff; a broad antemedial band of tawny irroration running oblique inwardly from the centre of the cell to the inner margin; a broad postmedial band of tawny irroration, roughly parallel with the termen, but approaching nearer the termen between veins *M*2 to *Cu*1; fringe pale pinkish-buff. Hind-wing, both wings beneath, and fringes, pale pinkish-buff.

Expanse: 24–39 mm.

1 ♂ (holotype) and 2 ♂♂ (paratypes), Mokanshan, Prov. Chekiang, v. (2) and ix.1930. Also 1 ♂ in the Mell collection, Kiukiang, ix.1919.

A very distinct species.

Porthesia coniptera, sp. n.

♂. Palpus and antenna Naples yellow. Body and legs mustard yellow mixed with Naples yellow. Fore-wing mustard yellow; a broad medial fascia of sparse fuscous black irroration, roughly at right angles to the inner margin, not quite reaching the costa; fringe mustard yellow, and a few long fuscous black hair-scales medially on the inner margin. Hind-wing and fringe, above and beneath, Naples yellow. Underside of fore-wing, and fringe, Naples yellow; on and beyond the discocellulars a large rounded patch of fuscous.

♀. The medial fascia on upperside of fore-wing and fuscous patch on underside of fore-wing less well marked than in the ♂, in one specimen almost obsolete.

Expanse: ♂ 29 mm., ♀♀ 35–38 mm.

1 ♂ (holotype) and 1 ♀ (allotype), Lungtan Mountains, Nanking, Prov. Kiangsu, 20.iv.1930; 1 ♀ (paratype), West Tien-mu-shan, Prov. Chekiang, 1600 metres, 22.v.1931.

Porthesia piperita, Obthr.

Leucoma piperita, Obthr. 1880, Ét. Ent., **5**: 35.

I refer to this species a ♂ from Mokanshan, near Hang-chow; a ♀ from Kiu-kiang, ix.1919; and perhaps two very rubbed ♀♀ from West Tien-mu-shan, Prov. Chekiang, 1600 metres, v.1931. In these specimens the pattern is much as in Askold and Japanese specimens, but the marking on the fore-wing likened by Oberthür to a "dog's head" has the "nose" extending almost or entirely to the termen.

Euproctis inconspicua, Leech.

Euproctis inconspicua, Leech, 1899, Trans. Ent. Soc. Lond., **1899**: 133.

1 ♂, 1 ♀, Nan-king, Prov. Kiangsu; 1 ♀, West Tien-mu-shan, Prov. Chekiang, 31.iii.1924.

The ♂ does not appear to have been taken previously, and is rather more heavily marked on the fore-wing than the ♀.

Euproctis flavotriangulata, Gaede.

Euproctis atomaria flavotriangulata, Gaede *in* Seitz, 1932, Grossschm. Erde, **2**, Supplement: 104, pl. 8*h*.

The holotype ♂ of this species, from Changku, is well illustrated in Seitz, with the apical spot about 1 mm. from the termen. The ♀ described by Gaede, as allotype, from Ta-tsien-lu, is not of this species, but is a *Porthesia*, with vein *M*2 absent in the hind-wing. It can be distinguished from the ♂ by the position of the apical spot, which is about 2½ mm. from the termen. This ♀ should be placed with the insects discussed under *Porthesia piperita,* Obthr., in the present paper.

In the Höne collection is a uniform series of 9 ♀♀ from West Tien-mu-shan, Prov. Chekiang, 1600 metres, 19–22.v.1931, which match the ♂ of *E. flavotriangulata* very well in appearance, and which I have no hesitation in placing under this name.

Euproctis flava, Brem.

Aroa flava, Brem. 1861, Bull. Acad. Sci. Petersb., **3** : 479.

The type of this species was taken in Ussuri.

In the Höne collection, I have for the first time met with a lengthy series of this puzzling insect, totalling some 157 ♂♂ and 10 ♀♀. They were taken in a limited area in Chekiang and Kiangsu.

An examination of the series shows that both sexes are rather uniform in size, with rounded wings as depicted in the illustration in Seitz II, pl. 21*e*.

In markings, however, there is great variation. Occasionally the fore-wing may be completely without spots or central fascia, in which case the ground-colour is usually more pale. The central fascia varies in width, and where it crosses vein *Cu*1 may be from less than 1 mm. to as much as 2 mm. in diameter. Further irroration may occur on each side of the central fascia from costa to inner margin.

A subterminal spot is nearly always visible between veins *M*1 and *M*2, and less usually a further spot in the apex between veins *R*4 and *R*5. A third spot may occur in the anal angle below vein *Cu*2. In exceptional cases, yet further inter-neural spots may be visible.

I believe that *Euproctis* (*Artaxa*) *intensa*, Butler (1877), type from Japan, cannot be regarded as distinct from the species under discussion, an opinion evidently arrived at previously by Dr. Matsumura, as he uses the name *E. flava* on p. 705 of his " 6000 Insects of Japan Empire."

Laelia monoscola, sp. n.

♂. Palpus ochraceous tawny, on the outer side mummy brown. Antennal shaft, head, thorax and abdomen cinnamon buff to tawny olive, with a tuft of ochraceous tawny at the base of the shaft. Pectinations of antenna Saccardo's umber. Pectus, venter and legs pinkish-buff, mixed on fore tibia and tarsus, and on mid and hind tarsus, with tawny olive. Fore-wing cinnamon buff; some tawny olive shading bordering each of the principal veins, and, more heavily, in the angles at the bases of the veins; a series of seven fuscous black postmedial interneural spots, the one between *M*2 and *M*3 more proximad than those above and below; fringe cinnamon buff. Hind-wing drab to hair brown, the fringe lighter. Underside of both wings, and fringes, pinkish-buff; fore-wing suffused with tawny olive except along costa, termen and inner margin; a faint patch of tawny olive on the discocellulars of the hind-wing.

♀. Lighter than the ♂; hind-wing and fringe, above and beneath, pale pinkish-buff.

Expanse : ♂♂ 46–49 mm., ♀♀ 53–57 mm.

1 ♂ (holotype), 1 ♀ (allotype), 5 ♂♂ and 1 ♀ (paratypes), West Tien-mu-shan, Prov. Chekiang, 1600 metres, iv. and vi.1931.

Very much like *Laelia anamesa*, Collnt., in appearance, but larger and darker. On the aedeagus a single short spine with a broad base. *L. anamesa* and *L. gigantea*, Butl., have both two spines on the aedeagus, narrower at the base and longer.

Dasychira axutha, sp. n.

♂. Palpus tilleul buff mixed with clove brown, and with a patch of the latter colour on the outer side. Antennal shaft, head and body pale drab grey mixed with olive brown. Pectinations of antenna ochraceous tawny. Pectus, venter and legs tilleul buff mixed with olive brown, the tarsi banded regularly with the latter colour. Fore-wing pale drab grey mixed with olive brown, the basal third of the wing rather lighter than the remainder; faintly marked olive brown antemedial and postmedial fasciae, the former almost straight and at right angles to the inner margin, the latter crenate; discocellulars faintly ringed with olive brown; a preterminal olive-brown fascia, roughly parallel with the termen; fringe pale drab grey mixed with olive brown. Hind-wing and fringe drab, with a darker spot on the discocellulars and a broad faintly marked postmedial fascia. Underside of both wings, and fringes, drab irrorated with olive brown; a dark spot on the discocellulars of both wings and traces of dark postmedial fasciae.

♀. Lighter and less strongly marked than the ♂.

Expanse: ♂♂ 38–40 mm., ♀♀ 51–57 mm.

1 ♂ (holotype), 1 ♀ (allotype) and 4 ♂♂ (paratypes), Mokanshan, Prov. Chekiang, 31.viii.–3.ix.1930; 1 ♀ (paratype), West Tien-mu-shan, Prov. Chekiang, 1600 metres, 21.v.1931.

In the ♂ sex somewhat resembles a small dark specimen of *D. grotei*, Moore, but without any yellow in the hind-wing. The genitalia are similar. The ♀ differs more widely from *D. grotei*, being brown instead of grey in general appearance and also smaller in expanse.

Dasychira glaucinoptera, sp. n.

♂. Palpus tawny olive. Antenna sepia. Head, thorax and abdomen tawny olive mixed with Saccardo's umber and sepia, beneath lighter. Fore and middle legs Saccardo's umber mixed with tawny olive, the femora and tibiae fringed with long hair; hind leg lighter. Fore-wing of various shades of brown, Saccardo's umber predominating; in the subbasal area, below the cell, a rounded patch of cinnamon brown ringed with fuscous black; the remainder of the basal half of the wing dusted with pale drab grey, giving a faint bluish effect; a dark antemedial fascia, almost straight, at right angles to the inner margin; discocellulars faintly bordered with fuscous black and beyond them a prominent lighter patch; a crenate fuscous black postmedial fascia, bowed (concavity basad) from costa to vein *Cu*1, thence again bowed (concavity terminad) to inner margin; a fuscous black preterminal fascia; fringe fuscous, lighter at the vein-ends. Hind-wing and fringe Saccardo's umber, lighter at the vein-ends. Underside of fore-wing tawny olive; a dark shade in and above the cell and a dark crescent on the discocellulars; an almost straight, inwardly oblique postmedial fascia, not reaching the inner margin; traces of a dark subterminal fascia; fringe as on upperside. Underside of hind-wing tawny olive; a dark mark on the discocellulars; traces of dark postmedial and subterminal fasciae; fringe as on upperside.

Expanse: ♂♂ 37–46 mm.

1 ♂ (holotype) and 5 ♂♂ (paratypes), West Tien-mu-shan, Prov. Chekiang, 1600 metres, viii. and ix.1931.

Superficially in markings somewhat recalls *Pseudodura dudgeoni*, Swinh., but differs structurally and is much larger in expanse.

ON SOME MICROGASTERINAE (HYM., BRAC.)

By D. S. Wilkinson, F.R.E.S.

(*Imperial Institute of Entomology.*)

Microgaster lepelleyi, sp. n.

♀. Black; the palpi, tegulae, all trochanters and trochantines, the front femora apically, the front tibiae and tarsi, the middle femora at apex below to some extent, the middle and hind tibiae at extreme base, red testaceous; legs otherwise, apart from the black coxae, red-brown, as are the mouth-parts; tibial spurs of posterior legs pale; wings hyaline; costal veins, stigma, metacarp, 1st abscissa of the radial, 1st transverse cubital, and 2nd abscissa of the cubital, uniformly brown; some other veins with some pigmentation.

♂. Black; the palpi, tegulae, the front femora apically, and certain portions of the front tibiae and tarsi, red testaceous; legs otherwise more or less throughout strongly darkened or black; tibial spurs of posterior legs pale; wings as in the female.

♀♂. *Head* closely punctate throughout (degree 3–4), or rugoso-punctate; the facial depressions distinctly nearer apex of clypeus than to the eyes; posterior ocelli very obviously nearer to each other than to the eyes. *Thorax*: mesonotum strongly and closely punctate, more strongly so (degree 4) along the lines of the notauli and on a narrow median longitudinal line, the punctures rarely contiguous (save possibly round the anterior margin) as in *M. carina*, Wilkn.; disc of scutellum with some strong punctures; the upper area of the lateral faces of the scutellum throughout with fine, spaced, longitudinal carinae, and its differentiation from the disc marked only by a narrow band of reticulate rugosity; the lower area of the lateral faces in the form of a broad, virtually parallel-sided, highly shining, entirely smooth band extending from right across each side without interruption across below the apex of the disc; propodeon with irregular, reticulate carination throughout and with a median longitudinal carina, of the same strength, that is more commonly present only in the basal half, but which occasionally extends throughout its entire length. *Wings*: 1st abscissa of radial equal to or even possibly rather longer than breadth of stigma, straight, and three times the length of the 1st transverse cubital with some thickening at their point of junction, where also is received the minute, hyaline, punctiform, 2nd transverse cubital; apical portion of 1st abscissa of cubital two-thirds the length of the radial, rather shorter than the recurrent, and twice the length of the upper portion of the basal vein, which latter is equal to the 1st transverse cubital but longer than the thickened 2nd abscissa of the cubital; stigma shorter than metacarp, but not greatly so. *Legs*: hind coxae rugoso-punctate. *Abdomen*: 1st tergite slightly excavate in basal two-thirds, its apical one-third turned over, entirely smooth save for a small but distinct, rugosely punctate area on each side in the neighbourhood of the base of the apical third, its lateral margins nearly parallel in the basal two-thirds, thence converging, so that the median length of the tergite is about twice its basal breadth and three times the breadth of its truncate apex (27 : 14 : 9); 2nd tergite smooth save for indications of a middle-field, with its median length equal to that of the 3rd tergite and rather less than the basal breadth of the 1st (12 : 12 : 14); 2nd suture obsolete; 3rd and succeeding tergites smooth save for the usual minute punctation; hypopygium small, just slightly acute; ovipositor sheaths short, without process.

Length, 3 mm.

East Africa: Kiambu, Kenya Colony, 1 ♂, 8.xii.1930, 1 ♀, 3 ♂♂, 8.xii. 1931,* 6 ♀♀ (one the *type*), 10 ♂♂, 1932 (*Dr. R. H. Le Pelley*).

* This date is probably an error made when the labels were being written out; it should be 1930, I believe.

Type deposited in the British Museum.

Host. The series dated 1930 and 1931 are labelled to have been bred from the ~~Noctuid~~ *Epigynopteryx ansorgei*, Warr., while the 1932 series is labelled *Epigynopteryx* sp., *ansorgei*, Warr., or *tabitha*, Warr.

Cocoons. Large, brown; the base is flattened, oval, and 4·5 mm. long by 2 mm. greatest breadth, and the greatest height of the cocoon is about 2·5 mm. The cocoons are irregularly formed, and, apart from the silk of which there is a fair amount, particularly on the extreme top, they have much the appearance of a large scale insect.

Having an unusual combination of characters, this new species will not run easily in any keys that I know. In a key of my own in manuscript it could be made to run to *earina*, Wilkn., *psarae*, Wilkn., or *vulpina*, Wilkn., but from these is immediately separable on either the shape or sculpture of the 1st tergite. It could be made to run in this key also to *wesmaelii*, Ruthe, or *flavipes*, Hal., but from these it is of course quite distinct. I cannot make it run either in Marshall's key to the Palaearctic species or in Muesebeck's key to the North American species.

Microplitis demolitor, sp. n.

♀♂. Black; palpi and all legs red testaceous, save that all coxae and trochanters, with portions of the trochantines, are black, and the hind tarsi are darkened; 1st, 2nd, and 3rd tergites red testaceous, save that the 1st is somewhat dark red sometimes, and the 3rd blackened in apical half; the wings strongly infumated with darker patches in the neighbourhood of the veins; stigma, metacarp, and wing-veins uniformly brown.

♀♂. *Head*: face and clypeus minutely rugose and dull; the facial depressions in the ♂ about equidistant from apex of clypeus and the eyes, in the ♀ rather nearer the eyes; frons and vertex smooth save for closely placed, minute punctation; ocelli raised on a slight tubercule. *Thorax*: mesonotum minutely rugose round the anterior margin, otherwise throughout with minute, rather closely placed punctures; the notauli present as weak but distinct, shallow lines converging on a large, equally shallow, median posterior area; the scutellar sulcus broad and very deep, with six crenulations; the mesopleural sulcus hardly crenulate; disc of scutellum with a distinct, crenulate groove just inside each lateral margin of the apical half, leaving the margins as sharp ridges, otherwise minutely punctate; propodeon rugosely reticulate, with a distinct, straight, median, longitudinal carina, and generally with transverse basal carinae, but these latter not straight but more as thickening of some of the reticulation. *Wings*: the 1st abscissa of the radial nearly at right-angles with the posterior margin of the stigma, somewhat longer than the upper portion of the basal vein, two-thirds the length of the 1st transverse cubital, which latter, together with the apical portion of the 1st abscissa of the cubital, the recurrent, and the 2nd abscissa of the cubital, are all equal; metacarp decidedly shorter than stigma. *Legs*: hind coxae minutely punctate, in length about equal to or just shorter than 1st tergite; hind femora not unduly stout, their length quite 3·6 times their greatest breadth; hind tibial spurs subequal. *Abdomen*: 1st tergite with its basal half slightly excavate medianly, and its somewhat rounded apex slightly turned over and just slightly contracted, the lateral margins otherwise virtually parallel throughout, the median length of the tergite twice its median breadth (32 : 16), the integument shining and virtually smooth there being only some indefinite sculpture; 2nd tergite smooth and shining with its apex slightly emarginate, its median length just less than the breadth of the extreme apex of the 1st tergite and two-thirds the median length of the 3rd tergite (12 : 14 : 18); 3rd and succeeding tergites smooth save for the usual minute punctation; ovipositor sheaths short.

Length, 3 mm.

Australia : Stanthorpe, Queensland, 2 ♀♀, 2 ♂♂, January 1932 (*H. Jarvis*). *Type* deposited in the British Museum.

Host. These specimens are labelled to have been bred from the Noctuid *Heliothis obsoleta*, F., now known as *H. armigera*, Hübn., on tobacco.

Cocoons brown, cylindrical, 4 mm. long, unevenly wrinkled, not longitudinally ribbed.

This new species runs in my key (1930, Bull. ent. Res., **21** : 23) to *spectabilis*, Hal., from which it may be easily separated if only on the shape of the 1st tergite. In Muesebeck's key (1922, Proc. U.S. Nat. Mus., **61**, art. 15 : 44) it can be made to run to *croceipes*, Cress., a species also bred from *Heliothis obsoleta*; but its hind femora are quite 3·6 times as long as their greatest breadth, as opposed to only three times in *croceipes*, while its total length is barely 3 mm., that of *croceipes* being 3·5 mm. It will also run in this key to *scutellatus*, Mues., but is separable on venational characters and the shape of the 1st tergite. In Marshall's key it could possibly run to *mediana*, Ruthe, which of course it is not.

Microplitis maculipennis, Szépligeti (1900).

India : Amarampalam R., Nilambur, Madras, 1 ♂, 22.iv.1933 (*C. F. C. Beeson*).

Host. This specimen was bred from the Noctuid *Ophiusa melicerta*, Drury, now known as *Achaea janata*, L.

Snellenius, Westw.

Snellenius, Westwood, 1882, Tijdschr. Ent., **25** : 19; Muesebeck, 1931, Proc. U.S. Nat. Mus., **79**, art. 16 : 9.

Snellenius philippinensis, Ashm.

Microplitis philippinensis, Ashmead, 1904, J. N.Y. Ent. Soc., **12** : 20; Wilkinson, 1930, Bull. ent. Res., **21** : 26.
Snellenius philippinensis, Ashmead, Muesebeck, 1931, Proc. U.S. Nat. Mus., **79**, art. 16 : 10.
Microplitis bimaculatus, Cameron, 1909, Soc. Ent., **24** : 133; Wilkinson, 1930, Bull. ent. Res., **21** : 24. **(Syn. n.)**

I am sinking Cameron's species, the type of which is in the British Museum, on the basis of five specimens that I have seen in the Baker Collection in the United States National Museum determined as *philippinensis*, Ashm., by Muesebeck.

Snellenius radicalis, Wilkn. **(conj. n.)**

Microplitis radicalis, Wilkinson, 1929, Bull. ent. Res., **20** : 206.

The genus *Snellenius* was unknown to me when I described this species.

Muesebeck in his notes on *S. philippinensis*, Ashm., considers that the strongly compressed condition of the antennae of *Snellenius* is not of generic importance. It is of interest to record, therefore, that the antennae of *S. radicalis* are compressed more strongly than those of *philippinensis*, but considerably more weakly than those of *vollenhovii*, Westw., the genotype.

NEW AND LITTLE KNOWN AFRICAN PSOCOPTERA

By J. V. Pearman, F.R.E.S.

A small collection of Psocids from Sierra Leone, Uganda, Zanzibar and Natal, received at the Imperial Institute of Entomology, has, by the courtesy of Sir Guy Marshall, been entrusted to me for examination before being deposited in the British Museum. Altogether there are fourteen species, belonging to the families Myopsocidae (1), Psocidae (7), Caeciliidae (5) and Lepidopsocidae (1); five are almost certainly, and one is doubtfully, referable to described species, and eight are new, the latter including the type of a new genus. With regard to the element of doubt in the determinations, it is to be noted that the identification of Psocids from descriptions, or by comparison of specimens, when superficial characters only can be taken into account is often difficult and unreliable. There are many instances of "critical species-complexes" (one is dealt with in this paper), and certainty in discrimination depends upon a knowledge of morphological details properly observable only in dissections.

All the specimens had been pinned or gummed on card; some were damaged, and some appeared to have had their colour and markings affected either by the killing agent or by climatic conditions. Psocids are better preserved in spirit (using the least quantity sufficing to keep them wholly submerged), except the scaly or densely-haired species which should be kept dry (preferably loose on beds of crumpled tissue paper or pinned, not gummed on card); best of all is a double series, part in spirit, part dry.

In the following descriptions Enderlein's venational nomenclature is followed. Some abbreviations have been used,—"I.O" signifies the ratio between the interocular space and the apparent eye-diameter as seen from the front of the head; f1, f2, and so on, are used for the flagellar segments of the antennae, counting away from the head; "*AP*" denotes the cubital fork cell (areola postica) so characteristic of Psocid venation; "*PS*" ptero-stigma. A ctenidium is a serrate-edged scale covering the base of a strong bristle on the legs; on the tarsi the ctenidia run in a row along the underside.

Explanation of Figures.

A = Head, F = Gonopore, G = Gonopods ♀, H = Hypandrium, P = Phallic sclerite, S = Subgenital plate ♀, T = Terminalia of abdomen.
The measurement scales relate to the wings only.

Family Myopsocidae.

Lichenomima cameruna, Endln. var. **intermedia,** var. n. (Fig. 1.)

♀. *Colour.* Head ochraceous, more or less distinctly spotted dark brown, particularly behind ocelli; clypeus with about a dozen indistinct, oblique, brown striae, the median pair short; eyes, labrum and palpi dark brown; antennae,—scape brown, pedicel and f1 brownish-yellow (remainder missing). Thorax brown, lobes bordered orange, antedorsum of mesonotum darkened anteriorly. Legs,—coxae and femora brown, latter with a pale patch near knees; tibiae and first tarsal segment yellow-brown with dark brown tips; second and third tarsal segments dark brown. Fore-wings sub-opaque; ground-colour creamy, thickly mottled with grey-brown scribbled marks; *PS* suffused reddish-orange; no hyaline areas, but a small silvery spot beside cu_2 and another just above it in the discal cell. The intensity of the colour varies in places, darkest are (*a*) a band following the outer margin from r_{4+5} to *AP*, and (*b*) a broad clouding running obliquely and narrowing from

behind *PS* to vein *ax*. Margin and all veins, except analis and ascending portion of cu_1, boldly spotted pale and dark; around the margin the pale spots are triangular in shape. Hind-wings hyaline, weakly tinged brownish; marginal vein between the ends of r_1 and r_{4+5} spotted pale and dark; veins mostly dark, *r* and *an* pale.

Morphology. Eyes of moderate size, situate below temples, I.O. $2\frac{1}{4} : 1$; ocellar patch flattish; cranial suture distinct but fine; antennal flagellum slender with short, fine, oblique ciliation; palpal end-segment sub-cylindrical with evenly rounded tip, about $3\frac{1}{2}$ times as long as wide, and three times the length of the penultimate segment. Tarsi,—basal segment stout, distal ones slender; hind tarsal segments in the ratio of $7\frac{1}{2} : 1 : 1\frac{1}{2}$ with 22, 1, 1 ctenidia respectively. Venation and genitalia as figured. Gonopore not surrounded by a sclerised platelet, but guarded by short rod-like thickenings.

Length of fore-wing 5·1 mm.

Fig. 1.—*Lichenomima cameruna*, Endln. var. *intermedia*, n. ♀.

Sierra Leone: Blama, 11.i.25, 1 ♀; Njala, 2.iv.32, 1 ♀ (*E. Hargreaves*).

Described from the brighter of the two specimens, the other appearing to have been discoloured by contact with a fluid. The examples do not wholly agree with either of the descriptions of the two known West African species, *cameruna*, Endln. 1904, and *guineensis*, Endln. 1914, but appear to show fewer differences from that of the former, and for this reason I have provisionally regarded them as possibly forms of that species.

Family Psocidae.

Recently* I have been able to show that the genus *Psocus* (Latr.) Hagen, as left after the separation therefrom of other genera by Kolbe, Enderlein and others, still contained discordant types. As a result of more precise definition, a large number of species can no longer be incorporated in the genus as restricted (which indeed occupies a rather isolated position), and cannot, at present, be assigned to any other. In order that reference to the displaced species may be made without ambiguity, I propose the name **Psocidus** for that of *Psocus* in its old wide sense of Hagen's concept (*i.e.* with two-segmented tarsi, toothed claws, and venation in which the discoidal cell is closed by the junction of cu_1 with *m*) for all species that cannot be definitely ranged in any of the genera erected hitherto. *Psocidus zanzibarensis*, sp. n. may be taken as the type of this genus, the scope of which will, however, be greatly modified when its components have been distributed among validly diagnosed genera. It is obvious that the first five of the following species represent at least three distinct genera, but it would be unwise to characterise them from partial data.

There are indications that further study will result in the family being divided into a number of subfamilies. Already one is clearly recognisable on both morphological and biological considerations, viz. Cerastipsocinae. Its particular features have been set out in 1933, *Stylops*, **2** : 159, and are further exemplified by the two species of *Psococerastis* described in this paper.

* 1932, Ent. Mon. Mag., **68** : 193–204.

Psocidus zanzibarensis, sp. n. (Fig. 2.)

♂. *Colour.* Head sulphur-yellow overlaid with broad, broken, dark brown markings radiating from the ocellar field; clypeus with 8–10 fine brown parallel striae, the two innermost approximated; labrum brown; palpi,—end segment brown, remainder whitish. Thorax dark brown, traversed by a pale yellowish median stripe, lobes of mesonotum edged very pale yellow. Legs light greyish-yellow, coxae dark brown, tarsi brownish. Forewings glassy hyaline marked with dark brown as figured. Veins dark brown, the following whitish,—base of r_{4+5} and a short adjoining part of *rs*, part of *m* before joining vertex of *AP*, cu_2 and analis. Hing-wings immaculate except for an indefinite mark in the costal cell above *r–m*; veins dark brown except basal half of radius and of *m* + *cu*, and analis.

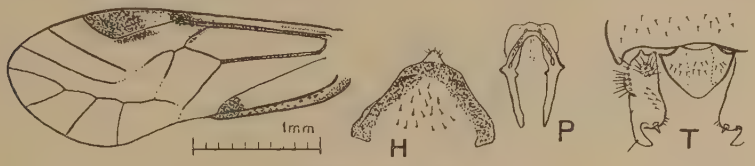


Fig. 2.—*Psocidus zanzibarensis*, sp. n. ♂.

Morphology. Eyes large, each in bulk greater than the clypeus, spherically protruding, slightly overtopping temples, I.O. approx. 1 : 1; (antennae wanting); clypeus well developed; ocelli on a rather large field, two hinder much the larger; palpi,—end segment ovoid-cylindrical, about three times as long as wide. Hind tarsal segments in the ratio $3\frac{2}{3}$: 1 with 20 and 2 ctenidia respectively. Venation, genitalia and telson as figured. Terminal abdominal segment not overhanging suranal plate; paraprocts with a large main sense-field and a smaller subsidiary one above, terminal spurs stout.

Fore-wing 2·7 mm.

Zanzibar: Mazi Moja, 20.viii–11.ix.1924, 3 ♂♂ (defective) (*H. J. Snell*).

Somewhat like *P. minutissimus*, Endln. 1908 (Fundu Isl.). The latter is, however, smaller (fore-wing 2·15 mm.), paler in colour, with a large brown spot on vein *m* + *cu*, a smaller hind-marginal spot, and a narrower *AP*.

Psocidus intricatus (Endln.). (Fig. 3.)

Psocus intricatus, Enderlein, 1910, Sjöstedt, Kilimandjaro-Meru Exped., **3**, (15) : 32.

♂. *Colour.* Head drab ochraceous, marked with irregularly-shaped brown spots, mostly radiating from ocelli; eyes and ocelli blackish-brown; clypeus with about 8 fine parallel

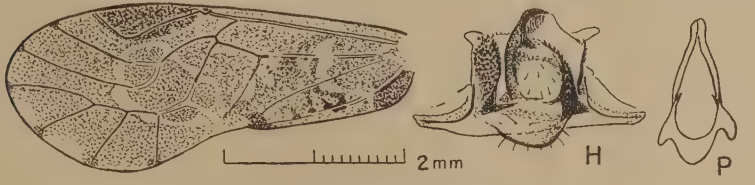


Fig. 3.—*Psocidus intricatus* (Endln.). ♂.

brown striae; labrum dark brown; antennae,—scape and pedicel pale brown, f1 yellow, f2 black (remainder missing). Thorax light brown, lobes varied lighter and darker and bordered yellowish, antedorsa of meso- and metanotum traversed by a median blackish stripe. Legs brown, coxae and tips of tibiae darker brown, likewise the tarsi. Forewings infumate brown marked with paler (not hyaline) indistinct spots and bars, a whitish, hyaline spot about cu_2, and some darker mottlings basally, as indicated in fig. 3 where the

pale marks have been deliberately over-emphasised; *PS* reddish-brown, granulose; veins generally dark brown, paler in basal area, the following yellowish,—base of radial fork, ascending section of cu_1, apex of *AP* and adjoining portion of *m*. Hind-wings wholly tinged pale greyish-brown, veins dark.

Morphology. Eyes very large, greater in bulk than the clypeus, overtopping temples, I.O. little less than 1 : 1; ocelli bold, hinder pair large; clypeus small, not highly tumid; antennae moderately slender with very fine obliquely outstanding ciliation; probably longer than wings (f3–11 missing); palpi not visible. Hind tarsal segments in the ratio 3 : 1 with 16 and 3 ctenidia respectively. Venation and genitalia as figured. Terminal abdominal tergite produced into a quadrate, sharply rectangular plate overhanging suranal plate.

Fore-wing 4·5 mm.

Uganda : Ebimanba, 24.x.1926, 1 ♂ (*H. Hargreaves*).

Colour apparently rather darker than that of the type, which had been preserved in spirit. Dry Psocids are nearly always darker, those in spirit lighter, than the living insects. The type has 24 and 4 tarsal ctenidia; whether this and other slight discrepancies between the two examples point to more than individual variation must be left for future elucidation.

Psocidus fucatus, sp. n. (Fig. 4.)

♂. *Colour*. Head dingy testaceous marked with spots and streaks radiating from ocelli; clypeus with about ten slightly oblique, broad, brown striae; labrum dark brown;

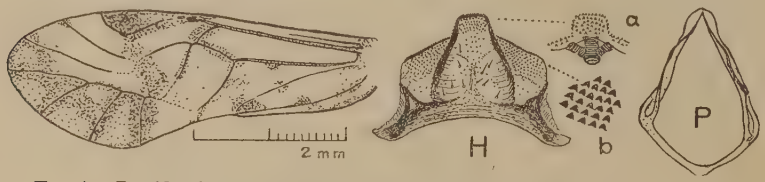


Fig. 4.—*Psocidus fucatus*, sp. n. ♂. a = inner aspect of apex of hypandrium, b = denticulation of surface of hypandrium.

palpi brown; antennae,—scape, pedicel and f1 yellow-brown, tip of latter and succeeding segments very dark brown; eyes and ocelli brown. Thorax brown, lobes of mesonotum piceous, shining (rubbed ?), edged whitish. Abdomen brown. Legs yellow-brown; tarsi brown; coxae, distal end of femora and tip of tibiae dark brown. Fore-wings hyaline, marked with brown as figured; outer margin of *PS* streaked creamy; veins brown, but *m* + *cu*, *an* and *ax* mainly yellowish, and the following parts hyaline,—base of radial fork, apex and proximal border of *AP* and adjoining portion of *m*. Hind-wings hyaline, veins brown except *an* and *ax* which are yellowish.

Morphology. Head relatively large; eyes small, each about half the bulk of the clypeus, not overtopping temples, I.O. about 3½ : 1; ocelli moderately large on a flattish circular field; clypeus moderate; palpi,—terminal segment sub-cylindrical with roundly pointed tip, and about four times as long as its diameter; antennae much longer than wings, flagellar segments moderately slender with fine, perpendicularly outstanding ciliation. Hind tarsal segments in the ratio 3 : 1, with 20 and 4 ctenidia respectively. Terminal abdominal tergite projecting in a flat curve over the base of the suranal plate, latter with a fleshy, pointed apex; spur of paraproct rather long, weakly curved, obliquely pointed. Wings and genitalia as figured.

Fore-wing 4·8 mm.

Natal : Weenen, x–xi.1924, 1 ♂ (*H. P. Thomasset*).

To the unassisted eye there is a deceptive resemblance between this species

and the later described *Psococerastis thomasseti* (among the examples of which it had been included), but the wing-colouring is of a more decided brown. The wing-markings are also much like those of the North American *P.* (*Psocidus*) *pollutus*, Walsh.

Psocidus usambaranus (Badonnel).

Psocus nebulosus, Ste. var. *usambaranus*, Enderlein, 1910, Sjöstedt, Kilimandjaro-Meru Exped., **3**, (15) : 33 (German E. Africa).

P. usambaranus, and var. *infuscatus*, Badonnel, 1932, Bull. Soc. zool. France, **57** : 110 (Mozambique).

The specimen is headless.

♀. *Colour.* Mesonotum brown, edges of lobes streaked yellow, its antedorsum with a moderately broad median pale stripe. Abdomen banded yellow and brown and with a median longitudinal brown stripe, apex dark brown, suranal plate and tips of paraprocts yellow. Legs light brown, tibiae at tips, and tarsi darker. Fore-wings tinged transparent brown and marked deeper brown, the markings arranged much as in *P. fucatus* (above) but more extensive, occupying the whole of cell R_5 (area between radial fork and median branches), the whole of *AP* and extending into the lower part of the discal cell, and forming larger and darker spots about the middle portions of *m* + *cu*, *an*, and *ax*, the two latter marks connected by a darkish band; *PS* blackish-brown distally, yellowish posteriorly; veins generally dark brown, but the following yellowish,—*r*, *m* + *cu*, *an*, *ax*, base of radial fork and proximal border of *AP*. Hind-wings uniform pale greyish hyaline with dark veins.

Morphology. Venation like that of *P. fucatus* (fig. 4) except in the form of *AP* which is even broader than that of *P. intricatus* (fig. 3). Sub-genital plate and genitalia somewhat like those of *P. guttulatus* (fig. 5).

Fore-wing 5·6 mm.

Natal : Weenen, iii.1924, 1 ♀ (*H. P. Thomasset*).

Badonnel gives figures of the genitalia of the male of *usambaranus* and of the fore-wing and the genitalia of the female of his variety *infuscatus*. The Natal specimen agrees very well with the description of the variety but is smaller (fore-wing 1·4 mm. shorter) and perhaps rather darker. When more material becomes available it will be possible to ascertain whether more than one species can be distinguished.

P. usambaranus is not congeneric with the European *Metylophorus nebulosus* (Steph.), of which it was at first supposed to be a variety.

Psocidus guttulatus, sp. n. (Fig. 5.)

♀. *Colour.* Head dingy ochraceous marked with irregularly parallel longitudinal rows of small brown spots; eyes brown; ocelli reddish; clypeus with rather widely separated dark brown striae, the two median ones meeting in front; labrum yellowish-brown, broadly bordered dark brown anteriorly and laterally; palpi yellowish-brown, terminal segment dark; antennae yellowish-brown, darker after f4. Mesonotum dark brown with some yellowish markings, antedorsum with yellowish median stripe. Abdomen varied yellowish and brown, beneath yellowish, apex dark, suranal plate yellow. Legs light brown, femora darker above, tibiae at tip and the ultimate tarsal segment also darker. Fore-wings subopaque; ground-colour creamy, thickly irrorated and clouded drab brown; veins mostly yellowish, the following fuscous,—radial fork (except at its base), the descending section of cu_1 and the whole of the median system between *AP* and wing apex. Hind-wings hyaline, tinged greyish, darkest in anal area, costal cell and some small areas below it pale; veins enclosing costal cell, also *an* and *ax* yellow, remainder fuscous.

Morphology. Insect of robust build. Eyes rather small, situate below temples, I.O. about $4\frac{1}{4} : 1$; ocelli on a slightly raised circular field; antennae longer than wings, flagellar segments slender with very short, oblique ciliation; clypeus large, tumid; palpi rather short and stout, terminal segment about three times as long as wide and a little longer than the penultimate, its tip evenly rounded. Mesonotal antedorsum nearly as large as side lobes.

Fig. 5.—*Psocidus guttulatus*, sp. n. ♀. ab = neural aberration.

Hind tarsal segments in the ratio $2\frac{1}{3} : 1$ with 23 and 6 ctenidia respectively. Fore-wings obliquely truncate on outer margin, so producing a high, sub-acuminate apex; veins mostly strong and rib-like but not particularly stout. Hind-wings sub-acutely pointed; veins fine but bold, $r - m$ junction a short confluence. Genitalia as figured; gonopore membranous, ovoid, very faintly pigmented.

Fore-wing 5·6 mm.

Natal: Weenen, iii.1925, 1 ♀ (*H. P. Thomasset*).

Subfamily Cerastipsocinae.

With some hesitation, I include the next two species in the genus *Psococerastis* although that course entails a slight amendment of the definition as given in 1932, *Ent. Mon. Mag.*, **68** : 202. The diagnosis will now read,—

With the general characters of the subfamily. Differing from *Cerastipsocus* and allied genera in venation by the wider separation of *rs* and *m* (hence there is less difference in the proportions of the discal cells,—see Kolbe, 1883, *Stettin. ent. Ztg.*, **44** : 65) and the broader apex of areola postica (exceedingly narrow or acuminate in *Cerastipsocus*). Genotype *P. gibbosa* (Sulz.).

The African species differ from the genotype in some details of venation and genitalia, and although undoubtedly closely allied may not be truly congeneric with it. However, it is advisable to proceed cautiously in making separations on the limited evidence at present available.

Psococerastis thomasseti, sp. n. (Figs. 6, 6a.)

♂♀. *Colour.* Head dingy testaceous with brown streaks and spots about eyes and behind ocelli, and a V-shaped mark between clypeus and fore ocellus; eyes and ocelli brown; clypeus with about ten moderately broad oblique striae, the median pair short; labrum dark brown; palpi,—ultimate and part of penultimate segment dark brown, remainder ochraceous; antennae,—scape, pedicel, and f1 ochraceous, tip of latter and the whole of the other segments blackish. Thorax brown, lobes edged pale and usually a pale stripe down middle of mesonotum, side lobes of mesonotum sometimes largely ochraceous. Abdomen banded ochraceous and brown. Legs ochraceous, the following dark brown,—coxae, patch at end of femora, tip of tibiae, distal part of first and whole of second tarsal segment. Fore-wings hyaline, marked dark greyish-brown as figured; veins *r*, $m + cu$,

cu, *an* and *ax* pale, base of radial fork and proximal portion of cu_1 white, the rest dark brown. Hind-wings hyaline, a faint brown cloud sometimes evident about the curve of vein *m*, and a brown spot at the wing root; veins generally brown, *r*, *an* and *ax* pale.

Morphology. ♀. Eyes very small, situate below temples, I.O. nearly 5½ : 1; ocelli on a flat field; antennae much longer than wings, flagellar segments very slender, ciliation very short and fine; clypeus large and tumid; palpi,—terminal segment about three times as long as greatest width, broadly rounded at tip. Hind tarsal segments in the ratio 3 : 1 with 21 and 5 ctenidia respectively. Wings and genitalia as figured. Gonopore plate of specimen dissected membranous, not pigmented.

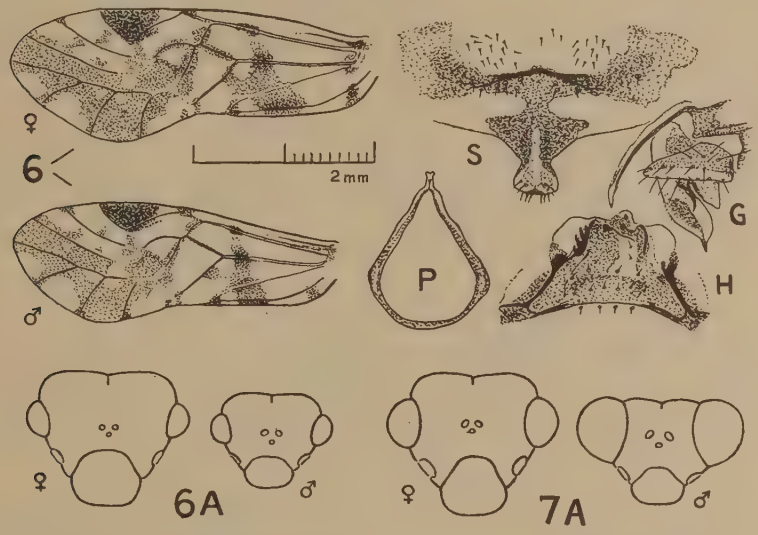


Fig. 6, 6a.—*Psococerastis thomasseti*, sp. n. Fig. 7a.—*P. fulleborni* (Endln.).

♂. Smaller than female. Eyes small, temples bare, I.O. about 4 : 1, individual bulk rather less than half that of clypeus; latter well developed; antennal flagellum slender but stouter than that of ♀, its ciliation longer than that of ♀ but short, obliquely outstanding (nearly perpendicular on f1). Hind tarsal ratio 2⅓ : 1, ctenidia 22 and 4. Wings and genitalia as figured. Terminal abdominal tergite produced into a bold, steeply rounded plate overhanging suranal plate; spur of paraprocts strongly tapering, slightly bent in middle.

Fore-wings,—♀, 4·0 mm.; ♂, 3·5 mm.

Natal: Weenen, v.1924, 2 ♂♂; x–xi.1924, 1♂, 2 ♀♀; 1.ii.1928, 1 ♀ (*H. P. Thomasset*).

The surprisingly wide range of dates suggests that there must be more than one generation annually, although that would be contrary to the usual condition in the family. There are no external indications that the examples are other than conspecific, and it was not considered reasonable to dissect all the specimens to decide a doubtful possibility. Dissections were made from a May male and an October female; the October male could not be removed from its card.

Psococerastis fulleborni (Endln.). (Figs. 7, 7A).

Psocus fulleborni, Enderlein, 1902, *Mitt. zool. Mus.*, **2** : 7 (German East Africa).
Psocus varians, Navas, 1931, Rev. Zool. Bot. afric., **21** : 131 (Belgian Congo).

Colour. Closely similar to the preceding species, but the wing-markings a little less extensive.

Morphology. Much as in the preceding species, but differing as follows. Eyes larger; ♀ small, each about half the bulk of the clypeus, temples bare, I.O. about 3¼ : 1; ♂ very large, each much greater in bulk than the clypeus, overlapping temples, I.O. 1¼ : 1. Antennae proportionally a little stouter; ♀ flagellar segments slender with short ciliation; ♂ flagellum moderately stout, ciliation fine, longer than in female, obliquely outstanding, more erect on f1. Wings and genitalia as figured. Gonopore of ♀ lightly pigmented as figured. Projection of last abdominal tergite of ♂ more broadly rounded; suranal plate somewhat truncate apically.

Fore-wings,—♀, 4·6 mm.; ♂, 3·6 mm.

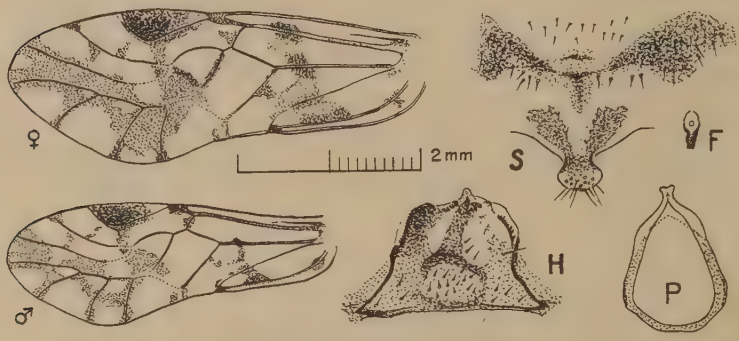


Fig. 7.—*Psococerastis fulleborni* (Endln.).

Sierra Leone: Sembehun, 1.vi.1925, 1 ♀; 17.vii.1925, 2 ♀♀ at light; Njala, 2.vi.1925, 1 ♀ at light; 19.vi.1925, 1 ♂ on oil palm; vi.1930, 1 ♀; Kennema, 13.v.1928, 1 ♀ on oil palm (*E. Hargreaves*).

The dates are more consistent with the average duration of Psocid longevity, three months, than are those recorded for *P. thomasseti*.

The two species form an interesting complex and so closely resemble one another as to be easily confused, but they are separable on external characters by differences in absolute and relative eye sizes (particularly as regards the males), in the extent of the wing-markings, and in the length of the fore-wings. Although the wing-marking of the Sierra Leone examples vary in some slight particulars from those figured by Enderlein for *fulleborni* (described from a single female) the variations are not so pronounced as alone to constitute reasons for doubting the identification.

A third related species, *zambeziensis*, with much reduced wing-marking has been described by Badonnel from Mozambique.

Parallel complexes can be instanced in the European species of the genera *Amphigerontia*, *Euclismia*, *Loensia* and *Trichadenotecnum*, also among several American species.

The pattern of the wing-markings suggests that the *fulleborni* group may be allied to the Oriental *taprobanes* series.

Family Caeciliidae.

Caecilius albiceps, sp. n. (Fig. 8.)

♀. *Colour.* Head pure white on the epicranium, otherwise shining castaneous; labrum darker; antennae,—scape, pedicel and first three flagellar segments whitish, remainder dark. Thorax shining very deep brown, a small white spot by the root of each fore-wing. Abdomen brownish. Legs light yellowish-brown, coxae partly suffused brown; end segment of tarsi brownish, claw black. Fore-wings marked dark chestnut brown and white; a light mark below the vertex of *PS* simulating a short spur-vein; veins brown, *r*, *an* and *ax* paler. Hind-wings lightly infumate greyish-brown with pale areas occupying the radial and radial-fork cells; veins *an* and *ax* pale, remainder dark.

Morphology. (Specimen damaged by indoor Psocids.) Head and body with rather close but short pubescence. Eyes moderate, set below temples, I.O. about 3 : 1; ocelli on a small round swelling; antennae about as long as hind-wings, end segment with a small terminal papilla; mouth-parts of usual Caeciliid form; pick with narrow apex. Hind tarsi in the ratio of 2 : 1, with 12 and 0 ctenidia respectively. Telson lobes with rather shaggy ciliation. (Genitalia damaged.) Fore-wing marginal vein stout except between *AP* and nodulus; ciliation of veins and margin not long, analis not ciliated, *PS* sparsely ciliated; microtrichia dense and bold. Hind-wings,—r_{2+3} going perpendicularly to fore margin; veins bare; margin with usual ciliation.

Fore-wing 2·45 mm.

Uganda: Kampala, 16.xi.1926, 1 ♀ (*H. Hargreaves*).

The venation and wing-pattern are much like those of the East African *C. signatipennis*, Endln., but the wing-colour is different (see 1932, *Stylops*, **1** : 92, fig. 3). *C. albiceps* is the smaller of the two species, and is readily distinguishable by its white epicranium. It may be allied to the oriental *C. aridus*, Hag. (see Enderlein, 1903, *Ann. hist. nat. Mus. hung.*, **1** : 267, Tab. xiii, fig. 68).

Fig. 8.—*Caecilius albiceps*, sp. n. ♀.
Fig. 9.—*Amphipsocus pictus* (Navas).

The next four species belong to a group notable for some common wing peculiarities. The fore-wing marginal vein is very broad above *PS*, tapering as it rounds the outer margin, and, except at the anal area, is closely beset with short and long cilia; the veins are ciliate on both surfaces of the wings, and there are cilia on the membrane within *PS*. In the hind-wings the margin is bare above the costal cell; the venational ciliation occurs on both sides of the free portions of *rs*, *m* and *cu*, but only on the underside of r_1 and *an*.

Amphipsocus pictus (Navas). (Fig. 9.)

Rosega picta, Navas, 1931, Rev. Zool. Bot. afric., **21** : 131 (Belgian Congo).

To the brief original description may be added the following :—

Colour. Eyes basally rimmed yellow. Antennae,—scape and pedicel brownish, f1–f3

pale ochraceous with brownish tips, remainder brownish. Lobes of mesonotum outwardly bordered pale ochraceous. Tinted portion of fore-wing (fig. 9) enclosing a hyaline central spot; dark portion of *PS* tinged red. Hind-wings tinged grey-brown in basal half.

Morphology. Ciliation of head and body moderately long, downy. Head rounded; eyes spherically protuberant, placed just below temples, I.O. about 2 : 1, individual bulk approximately equal to that of the small flattish clypeus; latter less in area than labrum; antennae about as long as a fore-wing, gently tapering, fl about as stout as a fore tibia. Thorax large, humped, lobe divisions deeply impressed. Hind tarsal segments in the ratio of nearly 3 : 1 with 18 and 1 (?) ctenidia respectively. Fore-wing venation as in fig. 9; upper ciliation of veins long, fine and mostly in a double series, on basal portion of radius and on $m + cu$ and *ax* in multiple series, on *an* a single row only; microtrichia very small and occurring only in patches between the vein endings, alongside all veins and over the coloured areas (except the costal cell). Hind-wings narrow, r_{2+3} running very obliquely to foremargin.

Fore-wing 4·1 mm.

Uganda: Kampala, 17.vi.1926, 1 ex. probably ♂ (*H. Hargreaves*).

Recognisable from other described species by the wing-colour. Except for the slightly smaller size (possibly a sexual difference), there is no reason to doubt the identity of the specimen with Navas' species. The genus *Rosega* was based on what were evidently neural aberrations, viz., the prolongation of the stigmal spur-vein to touch *rs* and the interpolation of a cross-vein between *m* and the vertex of *AP*.

Harpezoneura speciosa, sp. n. (Fig. 10.)

Colour. Head deep brown; labrum testaceous; eyes yellow with a large black spot outwardly; antennae brown, distally darker. Thorax pitchy brown, lobes margined paler. Abdomen discoloured. Legs light brown. Fore-wings hyaline, lightly infumate basally; *PS* red, in streaks; veins mostly dark. Hind-wings hyaline, weakly infumate; veins dark.

Morphology. Head and body with longish downy ciliation. Head rounded; median suture fine; eyes small, spherically protuberant, placed just below temples, I.O. about 3 : 1, bulk of each about half that of the moderately sized clypeus; ocelli approximated, tubercular; frons with an oval impression medially, side margins slightly elevated; labrum broad, not unduly large; palpi not visible; antennae a little shorter than the fore-wing, fl nearly as stout as a fore tibia, flagellum gently tapering and with oblique fine ciliation. Thorax high, lobar divisions deeply impressed. Legs with fine longish, bristly ciliation; a row of ctenidia on the basal segments of both mid and hind tarsi; hind tarsal ratio about 3 : 1. Fore-wing upper venational cilia in apical region mostly in a single or indistinctly double series, in basal area in double or triple series, on analis in a single row; cilia specially dense, in tufts, at the dark spots on $m + cu$ (1) and *ax* (3); the fine, minute microtrichia are densest between *AP* and base, sparsely distributed throughout the basal area, occurring only in small patches between the veins running into the apex and hind margin, elsewhere almost completely wanting; in both fore-wings the upper arm of radial fork has 4 branches (but not in identical arrangement) and *m* has 6 branches. In both hind-wings the radial fork has 3 branches (upper arm forked) and *m* is forked.

Fore-wing 4·4 mm.

Uganda: Fort Portal, 20.x.1926, on coffee, 1 ex. probably ♂ (*H. Hargreaves*).

Harpezoneura pallens, sp. n. (Fig. 11.)

♀. *Colour.* Head testaceous, cheeks broadly streaked brown from sides of clypeus across antennal sockets to eyes; labrum and palpi very pale yellowish; eyes greyish;

ocellar tubercle shining piceous; antennae,—scape and pedicel brownish, flagellum pale yellowish. Thorax dark brown, antedorsum of mesonotum with an obscure pale median stripe. Abdomen discoloured. Legs pale yellowish, claws black. Fore-wings hyaline, with some very pale brown marks, as figured; veins mostly yellow-brown. Hind-wings hyaline, veins mostly yellow-brown.

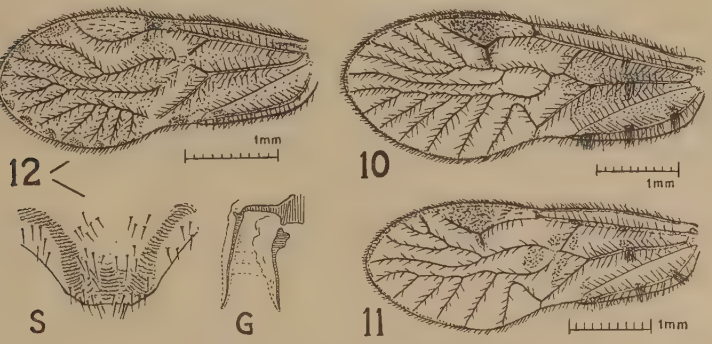


Fig. 10.—*Harpezoneura speciosa*, sp. n.
Fig. 11.—*Harpezoneura pallens*, sp. n. ♀.
Fig. 12.—*Schizopechus marshalli*, gen. et sp. n. ♀.

Morphology. Ciliation of head and body fine, longish and downy. Head rounded on vertex; median suture finely impressed; eyes moderate, nearly spherically protuberant, placed below temples, I.O. about 3 : 1, individual bulk about one-third that of the clypeus; latter of moderate size, flattened in front; frons with an oval median depression, side margins slightly elevated; ocelli approximated on a tubercle; labrum larger in area than clypeus, broad, angulate laterally, fore margin concavely truncate; palpi,—terminal segment lightly clavate with ovoid tip, and about twice the length of the penultimate segment; antennae (broken off after f3),—f1 not quite so stout as tarsi, flagellar ciliation fine, oblique. Thorax moderately large, lobar divisions deeply impressed. Legs with fine ciliation; hind tarsal ratio about 3 : 1, ctenidia 18 and 0 (no ctenidia visible on mid tarsi). Subgenital plate and gonopods similar to those of *Schizopechus marshalli*, sp. n. (below, fig. 12), but the gonopods slightly wider basally. Telson lobes semi-elliptical, their apices thickly beset with longish hairs; paraprocts with usual sensory areas. Fore-wing upper venational ciliation mostly in a single series, but on *r*, *m* + *cu*, and *ax* in triple series, on *an* a single row; at the dark spots on *m* + *cu* (1) and *ax* (2) a number of cilia bunched together; surface everywhere beset with fine minute microtrichia; radial fork similar in both wings; *m* in wing not figured with 4 branches (m_4 shortly forked). In the hind-wings the upper arm of radial fork with two branches in both wings; *m* simple in one wing, forked in the other.

Fore-wing 4·1 mm.

Sierra Leone: Magbenta, 17.ix.1924, 1 ♀ (*E. Hargreaves*).

Somewhat like *H. multifurcata*, Endln. 1909 (fore-wing 3·4 mm.), but larger and with the venation less crowded apically.

Schizopechus, gen. n.

Genotype *S. marshalli*, sp. n.

Mouth-parts, genitalia, legs and claws of usual Caeciliid type. Particularised by the multiramous condition of cu_1 in the fore-wings. *AP* wide, elliptical; branches of *m* short

and running into wing-tip; *PS* without a spur-vein; all veins with bristly ciliation. Hind-wing venation similar to that of *Amphipsocus*.

Allied to *Dasypsocus*, Enderlein 1906, with a relationship somewhat analogous to that of *Harpezoneura* to *Amphipsocus*.

Schizopechus marshalli, sp. n. (Fig. 12.)

♀. *Colour*. Head dingy whitish; clypeus and labrum light brownish with a reddish tinge; palpi reddish-yellow; eyes outwardly black, basally broadly rimmed yellow; antennae yellow. Thorax brown. Abdomen brownish. Legs yellow. Fore-wings hyaline with very pale brown markings as figured; veins generally pale but brown in places. Hind-wings hyaline with a faint brown outer marginal border (interrupted at the vein ends) running from r_{2+3} to *cu*, and a brown spot at the root of radius (on Hagen's " sieve "); veins in middle of wing brown, elsewhere paler.

Morphology. Ciliation of head and body very short and fine, with a few longish cilia interspersed. Head obliquely indented medially on vertex; median suture distinct, frontal sutures unmarked; eyes hemispherical, pubescent behind, placed below temples, I.O. about $3\frac{1}{4}$: 1, each in bulk a little less than half that of clypeus; latter of moderate size, transverse, flattened in front; ocelli nil; labrum greater in area than clypeus, rounded laterally, lightly concave anteriorly; palpi,—end segment weakly clavate with ovoid tip, and about twice the length of the penultimate segment; antennae a little shorter than fore-wing, flagellum slender, fl about as stout as tarsi, ciliation shortish, oblique. Basal segment of mid tarsi with 12 ctenidia; hind tarsi in the ratio of about 3 : 1 with 22 and 4 ctenidia respectively, the co-related bristles not curved. Fore-wing upper venational cilia mostly in a confused double series (in places appearing as in a single row), on *r*, *m* + *cu* and *ax* in triple series, on *an* a single row; shorter cilia on the membrane around the margin where spotted and within and below *PS*; microtrichia extremely minute, evenly distributed over whole wing surface; in the wing not figured cu_1 has 6 branches (the terminal one forked). Hind-wing membrane ciliated around margin between ends of r_1 and *cu*; microtrichia as in fore-wing except for a basal, subcostal patch on the lower surface, where they are denser and longer. Sub-genital plate weakly pigmented; gonopods connected by fine membrane. Telson similar to that of *Harpezoneura pallens*, sp. n. (above).

Fore-wing 3·5 mm.

Uganda : Kampala, 1.vii.1926, 1 ♀ (*H. Hargreaves*).

Family Lepidopsocidae.

Soa flaviterminata, Endln.

Soa flaviterminata, Enderlein, 1906, Spol. zeylan., **4** : 79 (Ceylon).

Sierra Leone : Kennema, 14.xii.1924, 1 ex., sex uncertain (*E. Hargreaves*).

Some slight differences in detail between this specimen and the type do not, by themselves, justify specific separation. I have been able to make a comparison with some Tahitian specimens that seem to agree better with the original description. The African insect is rather smaller and has more prominent ocelli (in the Tahitian forms the hinder pair minute, the frontal one not distinguishable); its fore-wings show a less extensive pale tract (whitish not yellowish) in the ciliate fringe, and have the basal part of the subcosta disconnected from the short veinlet above the trapezoidal cell.

S. flaviterminata has been recorded also from Java and the Seychelles.

NOTES ON CERATOPOGONINES (DIPT.) FROM HAWAII

By J. W. S. Macfie.

Dasyhelea hawaiensis, sp. n.

A very dark brown or blackish species, with femora and tibiae dark brown, thus resembling *D. pacifica*, Macfie, but differing as indicated below.

♂♀. Length of wing, about 0·9 mm.; greatest breadth of wing, 0·3 to 0·4 mm.

Head very dark brown, blackish. Eyes densely hairy. Palpi pale brown: segment 3 sub-cylindrical, without pit; lengths of last three segments in both sexes about 12, 6, and 7 units respectively. Antennae dark brown, in male darker than in female, but with

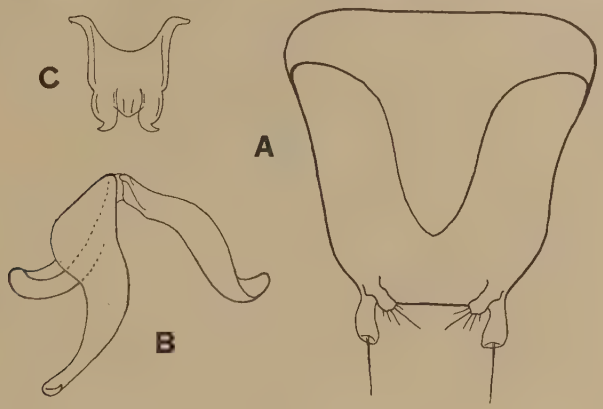


Fig. 1.—Parts of hypopygium of male, ventral views as seen under microscope; A—ninth segment; B—harpes; C—aedeagus.

bases of segments 4–11 paler; segments sculptured. In male plume black: segments 4–11 ranging in one specimen from 10 by 8 to 10 by 5 units; 12–14 binodose, lengths about 14, 17, and 18 units respectively; 15 about 20 by 5 units, without stylet. In female segments 4–10 sub-spherical to oval, in one specimen from 8 by 7 to 9 by 5 units; 11–15 only slightly more elongate, 11–14 sub-equal, 11 by 5 units, 15 about 18 by 6 units, without stylet. The combined lengths of segments 11–15, 4–10, and 3–10 about 62, 59, and 69 units respectively.

Thorax very dark brown, without obvious adornment. Scutellum slightly paler than scutum, especially in female; bearing two lateral and four centromarginal bristles, but no small hairs.

Wings unadorned, veins hardly darkened. Macrotrichia not very dense but extending practically to base between *M* and *Cu*; bare areas along veins well defined. Costa reaching just beyond middle of wing. First radial cell obliterated; second as in *D. pacifica*, quite small, almost square in male, slightly longer in female. Forking of *Cu* about at (female) or slightly distal to (male) level of end of costa. Halteres with brownish knobs.

Legs with all femora, tibiae, and fifth tarsal segments dark brown; other tarsal segments much paler. T.R. in both sexes 2·5.

Abdomen very dark brown. Spermathecae single, well chitinised, oval, about 50 μ by 30 μ, the commencement of the duct hardly at all chitinised. Hypopygium blackish.

Ninth tergite bearing at each posterior angle a small hairy process, and a larger finger-like process the end of which is hollowed and bears a single bristle. Ninth sternite without bristles, prolonged posteriorly as a conical process ventral to aedeagus. Side-pieces and claspers of usual form, the latter very dark. Harpes and aedeagus very dark, as shown in the figure which represents their appearance in ventral view as seen under the microscope.

Hawaii: Hering Valley, Tantalus, Honolulu, "from worm-lava in algae," 5.vii.1933, 1 ♂, and "from wet debris," 29.iii.1930, 1 ♀ (*F. X. Williams*); and also "as adults by waterfall," 9.vii.1933, 2 ♀♀; and 26.vi.1933, 1 ♂ (*F. X. Williams*).

Forcipomyia ingrami, Carter.

Hawaii: Kilauea, "in cabbage," 17.x.1929, 3 ♂♂, 3 ♀♀ (*O. H. Swezey*); Oahu, 1932, 1 ♀ (*F. X. Williams*); Hafeavau (?) stream, Waiauge Oahu, "near water," 3.i.1932, 1 ♀ (*F. X. Williams*); Woodlawn, Honolulu, Oahu, "on window," 20.ii.1932, 1 ♂, 1 ♀ (*F. X. Williams*); Nauhi Gulch, 5000–6000 ft., "on manure," Oct. 1931, 1 ♀ (*Swezey & Williams*); Woodlawn, Honolulu, "on fresh paint," Spring 1933, 5 ♀♀ (*F. X. Williams*); Hering Valley, Tantalus, Honolulu, "from cow-faced larva on wet bank," 17 and 26.vi.1933, 1 ♂, 1 ♀ (on mount with *Dasyhelea*), "as adult about algae, waterfall," 1 ♀, and 31.viii.1933, 1 ♂ (*F. X. Williams*).

The specimens are exceptionally dark in colour, but do not seem to differ from typical examples of *F. ingrami* in any material respect, except in having the first tarsal segment in the males unusually long, slightly longer than the second segment instead of rather shorter, the tarsal ratio being about 1·1 instead of about 0·8. The genitalia of the males appear to be indistinguishable from those of *F. ingrami*. For this reason, and because *F. ingrami* is known to be somewhat variable, there does not seem to be any sufficient reason for considering these specimens as distinct from that species.

F. ingrami has now been recorded from Samoa, Marquesas Is., Sumatra, and Malaya as well as from Africa.

NEW AND RARE ODONATA FROM THE BURMA–SIAMESE FRONTIER

By Lt.-Col. F. C. Fraser, I.M.S., F.R.E.S.

Among a small collection of dragonflies which I received last year from Dr. A. F. G. Kerr, late Director General of Agricultural Research to the Government of Siam, and which he had collected on the Burma–Siamese frontier, are three interesting Platystictines. Two of these belong to the genus *Protosticta* and are new to science; the third is a *Drepanosticta* and although not new, has only been described from teneral or non-adult material, so that the description is very inadequate, especially as regards the anal appendages which in the type are very distorted and shrivelled up. Dr. Kerr's specimen is fully adult, and I am now able to furnish the full particulars which were largely lacking in the primary description.

Protosticta curiosa, sp. n.

♂. Abdomen 40 mm. Hind-wing 18 mm.

Head: labium yellowish; labrum, bases of mandibles and anteclypeus turquoise blue, the former bordered narrowly with black; postclypeus brown bordered with black; rest

of head black but an elongate pale bluish spot between the bases of antennae, which latter have the two basal segments white; eyes dark blue to black. *Prothorax* yellow or pale blue with a pair of black dorsal spots on each of the anterior, middle and posterior lobes, the latter pair very close together. *Thorax* bronzed brown on dorsum paling and changing to pale blue on the sides and with narrow black oblique stripes on the anterolateral and posterolateral sutures. Legs pale yellow, tibiae spotted with black. *Wings* very short and very narrow, hyaline; pterostigma slightly longer than broad especially in the hind-wing, covering 1 cell, black framed finely in yellow; 15 postnodal nervures in fore-wings, 14 in the hind; *Riv* + *v* arising at or a little distal to the nodal nervure. *Abdomen* black with

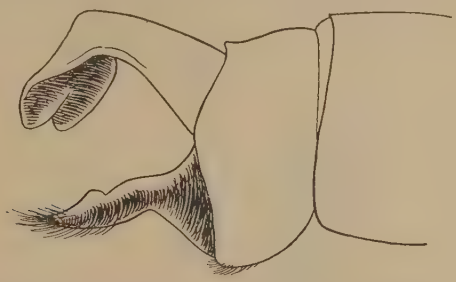


Fig. 1.—*Protosticta curiosa*, sp. n., anal appendages of ♂.

the sides of segments 1 and 2 and basal annules on segments 3 to 7 pale blue or white; segments 8 and 10 unmarked but segment 9 entirely blue save for its ventral border which is narrowly black. *Anal appendages* black; superiors broad at base, tapering slightly as far as the middle, at which point they are sharply angulated downwards and inwards at nearly a right angle. Beyond this they are greatly broadened, spatulate and hollowed out on the inner side. Inferiors of more intricate shape, broad at base, then narrowing, cylindrical and very sinuous with nearly the apical half divided off by a deep constriction, after which the appendage dilates again and then tapers to an acute point at apex which is furnished with a pencil of stiff yellow bristles.

Lower Burma: East Mergui. A single male (*Dr. A. Kerr*), 31.v.32.

This species appears to be rather closely related to *P. foersteri*, Laid., but the inferior appendages of the latter are much narrower and are curved inwards at the middle. It is by no means certain that Laidlaw's female, the type of *P. foersteri*, is conspecific with his male.

Protosticta medusa, sp. n.

♂. Abdomen 35 mm. Hind-wing 22 mm.

Head: labium pale yellow; labrum, bases of mandibles and anteclypeus turquoise blue, the former rather broadly bordered with black; rest of head steely black; eyes dark brown or blue. *Prothorax* blue with a middorsal black stripe, broad on the posterior lobe and gradually tapering away on the middle and anterior lobes. A broad black stripe on each side; posterior lobe quadrate behind. *Thorax* bronzed black on dorsum as far lateral as the anterolateral suture; laterally pale blue with a broad black oblique stripe on each side; beneath yellow. Legs pale bluish-white, femora broadly black on extensor surface, the tibiae on the flexor. *Wings* hyaline palely enfumed; pterostigma quadrate, brown narrowly bordered with white, covering 1 cell; 12 to 13 postnodal nervures in fore-wings, and hind-wings; *Riv* + *v* arising far distal of the nodal nervure. *Abdomen* blackish-brown

deepening posteriorly to form broad black apical annules on segments 4 to 6; segments 1 and 2 blue on the sides; segments 3 to 7 with narrow basal blue annules or paired dorsal spots; segments 8 to 10 pale azure blue on dorsum, this colour tapering to a basal point on segment 8. *Anal appendages* black; superiors of the most intricate and unique shape, very massive at base and almost at once branching, the two branches forming a capital T with the basal portion, the superior branch a long robust cone which is blunt at apex and furnished with a thick tuft of long reddish-brown hairs which flow out backwards like a horse's tail. The two cones of the superior appendages are closely opposed and form a conspicuous robust spine directed upwards and towards the base of segment 10. The inferior branch very sinuous, narrower than the superior, angulated downwards and inwards at its middle, then constricted and again broadening out at the apex to form a foliate, spatulate-like structure shaped like the human foot in profile. Inferior appendages

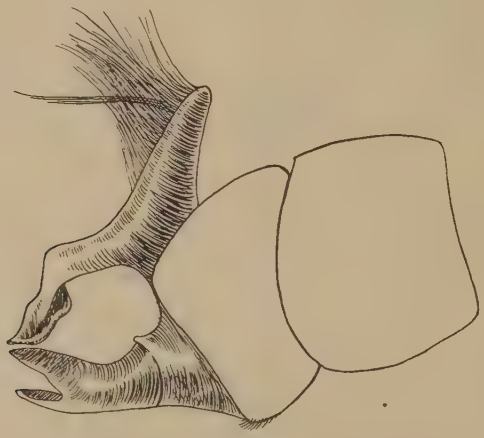


Fig. 2.—*Protosticta medusa*, sp. n., anal appendages of ♂.

very broad and conical in rather less than the basal half, then narrowing, cylindrical and ending in a bifid-like structure which is directed slightly inwards and is as long as the inferior branch of superior appendages. Female unknown.

Lower Burma: East Mergui. A single male (*Dr. A. Kerr*), 31.v.32.

This new species is easily distinguished from all others by its unique anal appendages, different from anything known in the genus.

Drepanosticta sharpi, Laidlaw.

Platysticta sharpi, Laid., Fasc. Malay. Zool., **4**: 10–11. (sep.) (1907).
Drepanosticta sharpi, Laid., J. Malay. Br. R. asiat. Soc., **2**: 304–305, pl. V, fig. 7 (1924); *Id.* J. F.M.S. Mus., **16**: 189 (1930).

♂. Abdomen 49 mm. Hind-wing 26 mm.

Head: labium white; labrum, bases of mandibles and anteclypeus turquoise blue, the former very broadly bordered with black; rest of head steely black; eyes black or blue; antennae with the two basal segments pale. *Prothorax* pale blue, the anterior border of anterior lobe and the whole of the posterior lobe black, the sides changing to pale brown; posterior lobe quadrate. *Thorax* bronzed black on dorsum as far lateral as the antero-lateral suture; the sides pale blue with a narrow oblique black stripe on the posterolateral

suture tapering below; beneath yellow. Legs yellowish, femora mottled with black on extensor surface, tibiae striped with the same colour on the flexor surface. *Wings* hyaline; pterostigma subquadrate but the costal border slightly shorter than the posterior, black finely framed in yellow, covering 1 cell; *Riv* + *v* arising very slightly distal to the nodal nervure; 15 postnodal nervures in fore-wings, 14 in the hind; *ab* arising far distal of the level of *ac* and running to the underside of discoidal cell. *Abdomen* blackish-brown deepening to black towards the end of segments 3 to 5, whilst segments 6 and 7 are entirely black; segments 1 and 2 narrowly blue at the sides; segments 3 to 6 with basal bluish annules

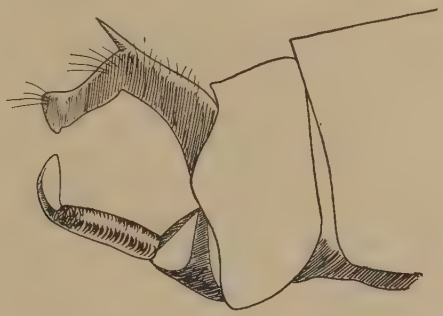


Fig. 3.—*Drepanosticta sharpi*, Laid., anal appendages of ♂.

interrupted on the dorsum; segments 8 and 9 azure blue on dorsum but the base of segment 8 broadly black; segment 10 black. *Anal appendages* twice the length of segment 10; superiors black, yellowish at apices, broad at base, angulated downwards at the middle, at which point is a very long robust spine on the dorsum directed back in the same direction as the basal portion of appendage; the apical portion flattened and truncate at apex. The whole appendage viewed in profile is shaped like the head of a race horse with a very long and grotesque muzzle, the superior spine representing the ears. Inferior appendages of unique design, pale yellow at base and apex, the basal portion striped with black, conical and very broad; from the apex of this cone, and as if jointed to it, springs a long cylindrical black stem from the apex of which a third apical portion shaped like a spoon projects upwards and inwards; on the inner side of the base of this a fine black spine projecting inward.

Fed. Malay States and Tenasserim. The type comes from Bukit Besar, 2,500 ft., May; a female was taken at Upper Padang, Perak, in January and a male from Kuala Tahan, in the month of March. Dr. A. Kerr has taken an adult male in East Mergui, 31.v.32, from which the above amended description has been made.

The type and paratypes are teneral or not fully adult, the anal appendages being distorted, but Dr. Laidlaw's figure of these latter is sufficiently well defined to show that Dr. Kerr's specimen is conspecific, especially in regard to the superior appendage; the inferior, however, does not bear comparison on account of distortion. The appendages of *D. quadrata* (Selys) are closely similar, but the apex of the inferiors is not notched nor is the end of the superiors dilated. The measurements of the two species also vary, *D. quadrata* being a much smaller insect. The markings of the prothorax and abdomen are similar in the two insects, and they must be very closely related.

AN AFRICAN SPECIES OF THE GENUS *STEGANA*, MEIGEN (DIPT. DROSOPHILIDAE)

By John R. Malloch.

The genus *Stegana*, Meigen, is widely distributed, occurring in Europe, Asia and southward to some of the islands in the Indian Ocean, and in both North and South America, apparently attaining its greatest number of species in Central America. Below I describe the first species I have seen from Africa.

Stegana africana, sp. n.

A small brownish-yellow species, with blackish-brown abdomen, the wings infuscated, more deeply so along the costa and with the tips whitish hyaline, legs yellow, apex of third antennal segment and the palpi black.

Length, 1·5 mm.

Head brownish-yellow, the frons entirely shining, ocellar spot fuscous, gena slightly darkened below eye, apical third of third antennal segment and the palpi except their extreme bases deep black. Frons at upper angles of eyes fully half as wide as its length in centre, gradually narrowed to anterior margin, the surface almost glossy, vertex sharp, the posterior ocelli close against the upper edge, with a pair of minute hairs between the posterior pair that are divergent and another similar pair below edge of vertex that are convergent, ocellar, vertical, and orbital bristles all distinct, the proclinate orbital longer than the reclinates, and above middle of frons, the three in a straight line, the anterior one of the latter not shorter than the posterior. Face concave, with very slight central carina. Eye about 1·5 times as high as long, bare. Gena almost linear, vibrissa single. Antennae of average size, second segment with a rather long bristly hair above; arista with about 11 long free hairs, four below. Palpi broad and leaf-like.

Thorax shining brownish-yellow, badly injured by the pin but apparently with a darker central vitta and lateral margins to mesonotum and the upper part of pleura also darkened. Mesonotum with the central bristles confined to extreme posterior margin where there is a long bristle near the lateral angle and between these a series of about six much finer bristles, the central pair longest, the surface irregularly and rather closely short-haired; scutellum of the usual shape, the apical pair of bristles distinctly shorter than the basal pair.

Legs entirely yellow. Fore femur with four or five posteroventral bristles that become much longer apically; fore tarsus slightly compressed, basal segment as long as the next three together, fifth twice as long as fourth.

Wings ovate, the costa arched, the tip narrow and rather pointed, infuscated on entire extent except a small part at tips that is whitish hyaline, the dark colour deepest along costa, especially in the marginal cell. Second section of costa fully twice as long as third; inner cross-vein slightly proximad of middle of discal cell; first posterior cell narrowed to base and to apex from level of outer cross-vein, at apex distinctly narrower than at base; penultimate section of fourth vein less than half as long as ultimate one; about half a dozen small black warts on the costal vein beyond apex of second vein.

Abdomen brownish-black, rather narrow.

Halteres brown.

Holotype, S. Rhodesia: Bindura, March 1932 (*A. Cuthbertson*), S. Rhodesia Dept. Agric.

Type specimen deposited in the British Museum.

This species is readily distinguished from the two European representatives that I have seen by the lack of dark pleural vittae, the presence of a very evident whitish hyaline apex to the wings, the partly black third antennal segment, and the narrower frons.

SOME NEW EXOTIC TRICHOPTERA

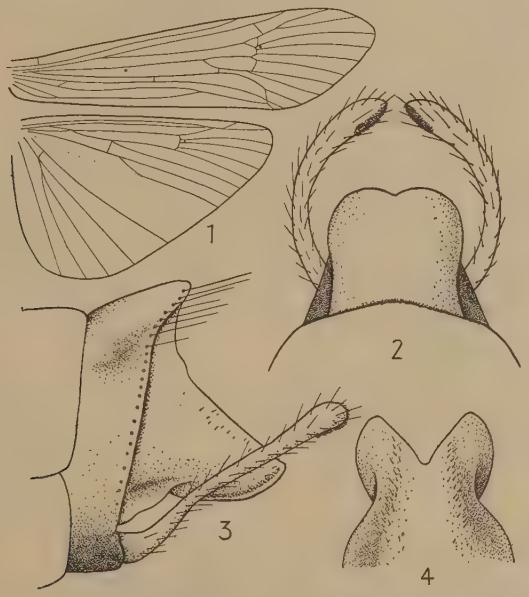
By Martin E. Mosely, F.R.E.S.

The four new species described in this paper are, as to three, amongst the accessions of the British Museum, whilst the fourth, *Cyrnellus zernyi*, belongs to a collection made by Dr. H. Zerny in Brazil and sent to the British Museum for determination and description where necessary.

Circumstances render it more convenient to deal with a few of these accessions at a time, but it is hoped that it may be possible at some future date to publish a paper dealing with Dr. Zerny's collection as a whole.

Macronema immaculata, sp. n. Figs. 1–4.

Head and *thorax* reddish-fuscous; at the vertex of the head are two large rectangular raised plates lying between the inner margins of the oculi and the bases of the antennae;



Figs. 1–4.—*Macronema immaculata*, sp. n. ♂. 1. Wings; 2. genitalia from above; 3. from the side; 4. upper penis-cover.

between these plates and close to and between the bases of the antennae is a rounded reddish wart; *antennae* reddish-fuscous annulated with somewhat darker rings; wings pale reddish-ochraceous with no markings of any kind, neuration as shown in the figure; *legs* of the same colour as the head and thorax; *abdomen* dark reddish-fuscous above, paler beneath.

Genitalia, ♂. Terminal dorsal segment much produced, from above appearing rectangular with the apical margin slightly excised; upper penis-cover wide with a wide excision at

the apical margin; from above it is broadly excised on each side about midway; inferior appendages apparently single-jointed, long and slender, slightly dilated at the apices.

Length of anterior wing, ♂, 16 mm.

Parana, Castro (*E. D. Jones*), 1905–163.

Type ♂ and two paratypes ♂ all labelled as above in the collections of the British Museum.

Macronema tonkinensis, sp. n. Fig. 5.

Head and *palpi* yellow; *antennae* partly broken in the unique type so that only a small length at the base of each remains; basal and next joint yellow, remaining joints

Fig. 5.—*Macronema tonkinensis,* sp. n. ♀. 5. Wings.

black. As the species is clearly akin to *distinguendum,* Ulm., the portions broken away were probably yellow; prothorax yellow, mesothorax and metathorax nearly black; *legs,* anterior, trochanter and tibia dark, nearly black, femur and tarsus yellow; median and posterior, trochanter very dark at the sides remainder yellow, other joints yellow throughout; spurs on all legs dark; *abdomen* yellowish, scarcely darker dorsally than ventrally. The neuration of the *wings* agrees closely with that of *distinguendum* but in the posterior wing fork 3 extends further inward in this species than in *tonkinensis.* The pattern is indicated in the accompanying figure.

Length of anterior wing, ♀, 11 mm.

Tonkin: Thai-Nien, Basin of Fleuve Rouge, 18.iii.1924 (*H. Stevens*).

Type ♀ in the collection of the British Museum.

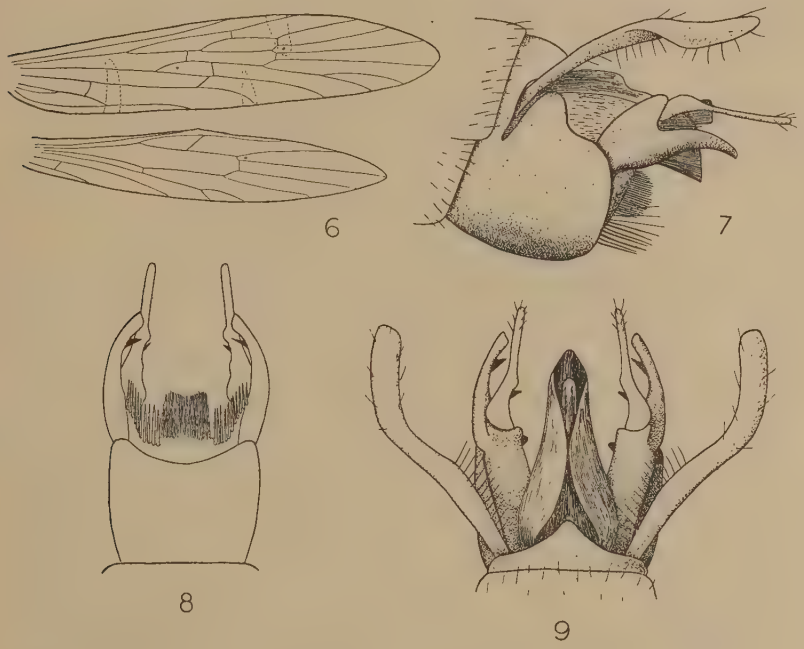
Having regard to the fact that the classification of the genus *Macronema* has been based mainly on colour pattern and markings of the wings, I have departed from my general custom of only describing new species from the male sex.

Melanotrichia trilineata, sp. n. Figs. 6–9.

Head dark fuscous clothed with nearly black hairs; antennae dark fuscous, basal joint large; palpi light fuscous, first three joints short, 4th equal to the 2nd and 3rd, 5th articulated and as long as or a little longer than the rest. *Wings*: Anterior dark fuscous with three short white vertical bars, one near the base extending from the posterior margin nearly to the sector, the second about midway extending from the posterior margin nearly as far as the upper branch of the upper cubitus, the third slightly nearer the apex but based on the costa and extending downward as far as the fourth apical cellule; fringes dark fuscous. Posterior wing slightly paler, fringes dark fuscous. *Legs* fuscous, spurs 1. 4. 4.

Genitalia, ♂. Terminal dorsal segment from above, produced at its margin to a triangular point. Superior appendages very long and strongly elbowed so that they are widely divergent. There is a slight twist in each towards the middle and the apices from

the side are slightly dilated. Beneath them is seen the upper penis-cover which is apparently fused with the lower penis-cover to make a sheath of which the upperside is folded over so that the edges are nearly in contact midway. From the side the cover is broad at the base, upper margin strongly chitinised, apex acute directed slightly downward. The penis is a long straight tube, the apex of which projects slightly between the upper and lower covers. Inferior appendages from the side, bifurcate, the upper fork articulated to the appendage and rather longer and more slender than the lower; from above upper margin strongly angulated towards the base which is much dilated; lower fork broad at the base, curving slightly downward to an acute apex. On the inner side of each fork, towards the base of the upper and towards the apex of the lower, is a sharp black tooth and from beneath, the



Figs. 6–9.—*Melanotrichia trilineata*, sp. n. ♂. 6. Wings; 7. genitalia from the side; 8. from beneath; 9. from above.

inner margins of the appendages, towards the base are armed with long yellowish bristles. Arising from the centre of the terminal ventral segment is an upturned plate covered with an exceptionally dense brush of short hairs obscuring its outline. On the fifth sternite are two small lateral plates nearly rectangular in form.

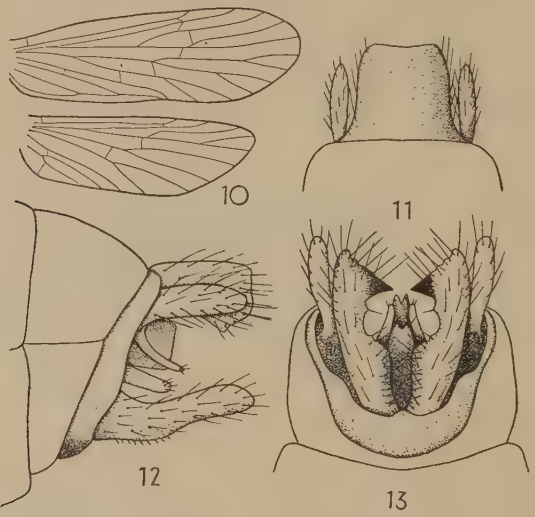
The female in general appearance resembles the male and is furnished with a long tapering ovipositor.

Length of anterior wing, ♂, 3 mm.; ♀, 4 mm.

Type ♂ paratype ♀ in the collections of the British Museum, Teapa, Tabasco, March (*H. H. S.*), type mounted in balsam.

Cyrnellus zernyi, sp. n. Figs. 10–13.

Head fuscous, *antennae* ochraceous faintly annulated with fuscous; *palpi* and *legs* pale fuscous. *Wings* clothed with fuscous hairs scarcely showing any markings.



Figs. 10–13.—*Cyrnellus zernyi,* sp. n. ♂. 10. Wings; 11. dorsal plate and superior appendages; 12. genitalia from the side; 13. from beneath, dorsal plate not shown.

Genitalia, ♂. Terminal dorsal segment produced in a large nearly square plate the sides of which are bent downward so that from the side it is deep, broadening towards a somewhat truncate apex. On each side, from above, are two narrow superior appendages. There is an upper penis-cover consisting of two narrow processes curving slightly downwards and backwards; penis very stout with a truncate apex which appears excised when viewed from beneath; lower penis-cover consists of a plate with an excised apex. Inferior appendages stout, seen from beneath, apices obliquely truncate, inner angles produced inwards at right angles in blackened spurs and nearly meeting each other; below these spurs the inner margins of the appendages are cut away in nearly semicircular excisions.

Length of anterior wing, ♂, 3 mm.

Unt. Amazon, Taperinha b. Santarem, 21–31.viii.1927 (*Zerny*).
Type ♂ and paratype ♂ in the collection of the Vienna Museum.

NOTES ON NINE GENERA OF HOLARCTIC RHOPALOCERA

By Francis Hemming, C.B.E., F.R.E.S.

In the following notes I fix the types of five genera of Rhopalocera that are at present without them. I also give notes on the status of three other genera, and propose a name for a genus that has at present no valid name.

(a) *Six genera of which the types are here fixed for the first time.*

Satyridae.

Epimede, Houlbert, 1922, in Oberthür, Ét. Lép. comp., **19** (2) : 132, 142, 160.

Type = *Halimede menetriesi*, Oberthür & Houlbert, 1922 (= *Arge halimede*, Mén., 1858).

Though nomenclatorially valid, the name *Epimede*, Houlbert, is not required, as *menetriesi*, Oberthür & Houlbert, is congeneric with *galathea*, Linn., the type of *Satyrus*, Latr., 1810.

Nymphalidae.

Diagora, Snellen, 1894, Tijdschr. Ent., **37** : 67.

Type = *Apatura japonica*, Feld. & Feld., 1862.

The name *Diagora*, Snellen, is perfectly valid and has rightly been restored by recent authors. Snellen, who fixed no type for this genus, placed in it only *Hestina mimetica*, Butler, 1874, and *Apatura japonica*, Feld. & Feld., 1862. Moore proposed (1896, Lep. Ind. **3** (26) : 34) the name *Parhestina* to replace *Diagora*, Snellen, which he wrongly rejected (*a*) on account of tautonymy and (*b*) as a homonym of *Diagoras*, Stål, 1877, which it is not. He specified *Diadema persimilis*, Westw., 1850, as the type of *Parhestina*, Moore, but that species cannot be the type of *Diagora*, Snellen, as it was not cited by Snellen when he founded the genus. The selection above of *japonica*, Feld. & Feld., as the type, fits in with existing practice, as that species is congeneric with *persimilis*, Westw. The name *Parhestina*, Moore, is, therefore, a synonym of *Diagora*, Snellen.

Hesperiidae.

Teleomorpha, Warren, 1926, Trans. Ent. Soc. Lond., **74** : 18, 46.

Type = *Papilio carthami*, Hb. [1808–1816].

Hemiteleomorpha, Warren, 1926, *Ibid.*, **74** : 19, 72.

Type = *Papilio malvae*, Linn., 1758.

Ateleomorpha, Warren, 1926, *Ibid.*, **74** : 19, 87.

Type = *Hesperia onopordi*, Rambur, 1842.

In the paper cited above, Warren created the three subgenera named above for various species of Black and White Skipper, all of which he placed in the genus *Hesperia*, Fab., in accordance with the then current use of that name by British entomologists. He, however, fixed no types for these subgenera. The selection of *carthami*, Hb., as the type of *Teleomorpha*, Warren, makes the latter name a synonym of *Scelotrix*, Rambur, 1858, of which also *carthami*, Hb., is the type; and the selection of *malvae*, Linn., as the type of *Hemiteleomorpha*,

Warren, makes that name a synonym of *Pyrgus*, Hb., of which *malvae*, Linn., was selected as the type by Westwood (1841, in Humphreys and Westwood, Brit. Butt. Transformations ed. **1** : 120). All three species are congeneric, as stated by Warren, and the names *Scelotrix*, Rambur (= *Teleomorpha*, Warren) and *Ateleomorpha*, Warren, are available for use as sub-genera of *Pyrgus*, Hb., though I do not myself consider such subdivisions necessary.

(b) *Notes on the status of three genera.*

Papilionidae.

Allancastria, Bryk & Eisner, 1932, Parnassiana, **2** (6/8) : 104.

Bryk and Eisner gave only *cerisy*, God., 1822, which is, therefore, the type. The name *Allancastria*, Bryk & Eisner, is invalid, as it is a name published without description after 31st December, 1930 (see resolution adopted by the International Zoological Congress in 1927). In any case, it would not, in my opinion, have been required, as I regard *cerisy*, God., as congeneric with *hypsipyle*, Schulze, 1776, the type of *Zerynthia*, Ochs., 1816.

Bhutanitis, Atkinson, 1873, Proc. Zool. Soc. London, **1873** : 570.

This name should be brought into use in place of *Armandia*, Blanchard (1871, C. R. Acad. Sci., Paris, **72** : 809 *nota* 3), which is invalid, as it is a homonym of *Armandia*, Filippi (1862, Arch. Zool. Anat. Fiseol., **1** (2) : 215). The type of *Bhutanitis*, Atk., is *Bhutanitis lidderdalii*, Atkinson, 1873, the only species placed in the genus by Atkinson. The type of *Armandia*, Blanch., is *Armandia thaidina*, Blanch., 1871, being also the only species placed in the genus by him.

Lingamius, Bryk, 1932, Parnassiana, **2** (2) : 20.

From the two species mentioned by Bryk, I here select *Parnassius hardwickii*, Gray, 1831, as the type. The name *Lingamius*, Bryk, is invalid for the same reason as *Allancastria*, Bryk & Eisner (above).

(c) *A new generic name.*

Hesperiidae.

Caicella, gen. n.

Generic characters—I select as the generic characters of *Caicella*, Hemming, the characters given for *Phoedinus*, Godman & Salvin, by Lindsey, Bell and Williams (1931, J. Sci. Lab. Denison Univ., **26** : 15, 37).

Type = *Caicella caicus* (H.-S., 1869) (= *Eudamus caicus*, H.-S., 1869).

The name *Caicella*, Hemming, is proposed, as the name *Phoedinus*, Godman & Salvin, 1894, (Biol. Cent.-Amer. Lep.-Rhop., **2** : 335) is invalid, being a homonym of *Phoedinus*, Guérin-Méneville, 1838 (Rev. zool. (Soc. cuv.) : 286), and as the name *Anaperus*, Mabille & Boullet, 1919 (Ann. Sci. nat. (Zool.) (10) **2** (4/6) : 232) proposed as a substitute for *Phoedinus*, Godman & Salvin, is also invalid, being a homonym of *Anaperus*, Troschel, 1846 (Arch. f. Naturg., **12** (1) : 60).

ON SOME *APANTELES* (HYM., BRACON.)

By D. S. Wilkinson, F.R.E.S.

(*Imperial Institute of Entomology.*)

Apanteles laxatus, Wilkinson 1930.

I am informed by Mr. G. H. E. Hopkins, who has access to the late Mr. Gowdey's series of numbers, that the host of this species is the Lymantriid, *Porthesia producta*, Wlk.

Apanteles gratiosus, Wilkinson 1930.

I am informed by Mr. Hopkins that the host of this species is the Lymantriid, *Dasychira goodi*, Holland.

Apanteles thoseae, sp. n.

♀♂. Head, thorax, 1st tergite, and ovipositor sheaths, black; scape, basal half of the flagellum more or less, mouth-parts, tegulae, all legs, remaining abdominal tergites and sternites, red testaceous, save that the 2nd tergite is quite often darkened; the wings distinctly infumated, with the stigma, metacarp, and wing-veins, uniformly brown.

♀♂. *Head:* face punctate (degree 2); the facial depressions nearer to apex of clypeus than to eyes; vertex highly shining, with only widely spaced, minute punctation (degree 1); the posterior ocelli nearer to each other than to the eyes. *Thorax:* mesonotum anteriorly, and laterally as far down as the tegulae, with well-marked (degree 3) and fairly well-separated punctures which posteriorly become increasingly minute and widely separated; disc of scutellum with some punctures; propodeon with some weak rugosity, more particularly in the apical half, and with some indefinite punctation basally. *Wings:* the 1st abscissa of the radial four-fifths the breadth of the stigma, longer than and very definitely angled with the transverse cubital, with a thickening at their point of junction that in some specimens gives the appearance of a punctiform 2nd abscissa of the radial; the transverse cubital barely longer than the recurrent, but longer than the apical portion of the 1st abscissa of the cubital, which is rather shorter than the pigmented portion of its 2nd abscissa and about equal to or just longer than the upper portion of the basal vein; stigma shorter than metacarp. *Legs:* hind coxae basally above and in at least the upper half of the outer faces entirely smooth and highly polished, otherwise highly polished and with but sparse minute punctures (degree 1); the longer hind tibial spur five-eighths, and shorter spur five-twelfths, the length of the basal joint of the hind tarsus. *Abdomen:* 1st tergite in basal half excavate and virtually smooth, the apical half strongly turned over and with aciculation and strong (degree 3–4), well-separated punctures along the lateral thirds, the sides of the tergite apparently regularly converging to the truncated apex, the basal breadth of the tergite being rather greater than twice its apical breadth, which is one-fourth the median length (14 : 6 : 24); 2nd tergite with its diverging discal sulci straight and reaching the 2nd suture, the disc of the tergite smooth except laterally where there is striation with some punctures; 3rd and succeeding tergites smooth; hypopygium truncate; ovipositor sheaths longer than the basal joint of the hind tarsus, but shorter than the hind femora.

Length, 2·5 mm.

Sumatra: Pematang Siantar, 17 ♀♀, 27 ♂♂, 12.iv.1931, Pematang Siantar, Boven Panei Conc., 3,000 feet, 6 ♀♀ (one the *type*), 5 ♂♂, 12.iv.1931 (*R. I. Nel*).

Type deposited in the British Museum.

Host. The shorter of these two series is labelled as having been bred

from the Limacodid *Thosea cruda*, Wlk.; and the longer, from "moth 7," which from our lists of determinations we find was also *T. cruda*.

Cocoons unknown.

This new species of *Apanteles* runs in my key (1932, *Trans. ent. Soc. Lond.*, **80**) to *A. badgleyi*, Wilkn., to which it is very closely related: it may be very easily separated, however, on the characters given below in the revised couplet.

Couplet 14 of my key will have to be altered as follows:—

14. Transverse cubital definitely and strongly angled with 1st abscissa of radial; 1st tergite wholly black . . . . . 14*a*.
Transverse cubital not definitely and strongly angled with 1st abscissa of radial; 1st tergite not wholly black . . . . . 15.

14*a*. Hind coxae dull, with close, fairly strong punctures basally above, and weaker and more sparsely placed punctures on outer faces (Assam) *badgleyi*, Wilkn.
Hind coxae highly polished and shining, entirely impunctate both basally above and on at least upper half of outer faces (Sumatra) *thoseae*, Wilkn.

Apanteles ugandaensis, Gahan 1918 (1919).

Kenya Colony: Kiambu, 20 ♀♀, 4 ♂♂, 2.ix.1930, 13 ♀♀, 2 ♂♂, 3.ii.1931, 12 ♀♀, 4 ♂♂, 1932 (*Dr. R. H. Le Pelley*).

Host. The above three series are labelled as having been bred from larvae of the Tortricid moth *Cacoecia occidentalis*, Wlsm. This is the first specific host record for this *Apanteles*, the type series having been recorded merely from a Pyralid on *Hibiscus*.

Cocoons pure white. The type series was without cocoons.

The males of this species were unknown hitherto. The ten that I have before me do not differ from the females in any character of systematic importance save in their antennae, which are filiform, longer than the body, and with their flagellar joints consequently not as described by Gahan; and the abdomen is rather shorter than the thorax.

It may be remarked that the North American species, *Apanteles cacoeciae*, Riley, is quite distinct from *ugandaensis* and belongs to a different section of the genus.

Apanteles obliquae, Wilkinson 1928.

Punjab, India: Hoshiarpur, 11 ♀♀, 9 ♂♂, 21.vii.1932 (*S. A. Shah*).

Host. This series is labelled to have been parasitic on a larva of the Arctiid genus *Amsacta*. It will be remembered that the type series was also bred from an Arctiid.

Apanteles cacao, sp. n.

♀♂. Black; the mouth-parts, scape, tegulae, the four anterior legs, the trochanters, trochantines and femora of the hind legs, the hind tibiae (save towards apex which is slightly darkened), the basal ventrites, the lateral membranous portions of the 1st and 2nd tergites, the 3rd tergite extensively, red testaceous; hind tarsi darkened as the apex of the hind tibiae; palpi and tibial spurs pale; the flagellum, wing-veins, stigma, and metacarp, brown.

♀♂. *Head* minutely punctate throughout; facial depressions distinctly nearer to apex of clypeus than to the eyes; the posterior ocelli in the females nearer to each other than to the eyes, in the males rather nearer sometimes equidistant. *Thorax:* mesonotum evenly and minutely (degree 1) punctate throughout; disc of scutellum with some widely scattered minute punctures; propodeon highly shining and almost entirely smooth, the only sculpture

being a few minute (degree 1) punctures medianly. *Wings :* the 1st abscissa of the radial shorter than the breadth of the stigma, longer than and definitely angled with the transverse cubital, which latter is rather longer than the recurrent; the apical portion of the 1st abscissa of the cubital about equal to the pigmented portion of the 2nd, shorter than the recurrent, longer than the upper portion of the basal vein; stigma as long as metacarp. *Legs :* hind coxae evenly and minutely punctate throughout; the longer hind tibial spur eight-thirteenths, and the shorter spur six-thirteenths, the length of the basal joint of the hind tarsus. *Abdomen :* 1st tergite with about its apical third turned over and down, excavate in basal half, in the lateral thirds of the basal half of the apical third with some well-marked punctures (degree 3) and short, minute aciculation, otherwise entirely smooth and highly polished, in the ♀ parallel-sided in about the basal third, and in the ♂ in about the basal half, thence regularly roundly contracted to the truncate apex, which is half the breadth of the base, the median length in the ♀ about 1·5 times the basal breadth (22 : 14), in the ♂ about 1·8 times (22 : 12), the male tergite consequently appearing to be more elongate; the extent and strength of the punctures and aciculation on this tergite variable, so much so in some males as almost to be entirely absent, in some females as to occupy the whole of the basal half of the apical third, and in some other specimens as to be represented by a narrow transverse line of punctures and aciculation right across the tergite but only at the extreme base of its apical third; 2nd tergite entirely smooth save for an occasional minute puncture, the discal sulci in the ♀ diverging in at least the basal half of the tergite at an angle of not less than 90°, thence slightly rounded and not so widely divergent, in the ♂ not widely divergent (definitely less than 90°) and appreciably straighter, often quite straight; 3rd tergite with median length in ♀ 1·66 times as long as that of 2nd (15 : 9), in the ♂ relatively rather shorter (14 : 9), unsculptured as are the succeeding tergites save for the usual minute punctures; lower posterior angle of hypopygium truncate; ovipositor sheaths not as long as hind femora.

Length : ♀, 2·5 mm.; ♂, 2 mm.

Ceylon : Peradeniya, 35 ♀♀, 16 ♂♂, 16.xi.1931 (*Dr. J. C. Hutson*).

Type deposited in the British Museum.

Host. This series is labelled to have been bred from *Lymantria ampla*, Wlk., on *Theobroma cacao*.

Cocoons white, constructed side by side to some sort of plan—not irregularly constructed.

This species runs in my key (1932, *Trans. ent. Soc. Lond.*, **80**) to *A. puera*, Wilkn. (couplet 42), to which it is extremely close. The two species may be separated, however, on the relative lengths of their 2nd and 3rd tergites; and consequently couplet 42 should be revised, as under :—

42. Scape as clear red testaceous as femora; discal sulci of 2nd tergite of female diverging at an angle of about, or hardly less than, 90° . . . . . 42*a*.
Scape darkened; discal sulci not so widely divergent . . . . . 43.

42*a*. Female with median length of 3rd tergite about 1·27 times as long as that of 2nd; 1st tergite of female virtually parallel-sided in quite basal three-fourths (India) . . . . . *puera*, Wilkn.
Female with median length of 3rd tergite about 1·66 times as long as that of 2nd; 1st tergite of female hardly so describable (Ceylon) *cacao*, Wilkn.

Apanteles africanus, Cameron 1911 (*nec* Viereck).

In my revision of the Ethiopian species of *Apanteles* (1932) I recorded a series to have been bred from a species of *Nygmia* on cotton, and with reference to that note Mr. Hopkins in a letter to me says :—" The '*Nygmia*' on cotton from which *A. africanus* was bred is almost certain to have been *Porthesia*

dewitzi, Grünberg (formerly *Euproctis isis*, B.-Baker); this is by far our commonest Lymantriid on cotton."

Apanteles paludicolae, Cameron 1909.

Uganda: Kylgegna, 1 ♀, 25.ii.1932, Serere, 1 ♂, 4.ii.1932, Kampala, 1 ♂, 19.ii.1932 (*H. Hargreaves*).

Host. Of this series the female is labelled "on pod of *Cajanus indicus*," and "almost certainly ex larva of *Marasmarcha crepuscularis*, Meyr. (Pterophoridae)"; and one of the males is labelled "on *Cajanus*," and the other "ex? caterpillar in pod of *Cajanus*."

I have already recorded this *Apanteles* to be a parasite of Pterophoridae, but not previously of this particular genus and not in Uganda.

Apanteles rugiceps, sp. n.

♀. Black; the scape, all the legs (except the coxae), red testaceous; palpi and tibial spurs pale; wing-veins, stigma, and metacarp, uniformly brown.

♀. *Head:* the face decidedly (degree 3) and rather closely punctate; facial depressions nearer to apex of clypeus than to the eyes; frontal orbits striate; the frons, vertex, round behind the eyes to the cheeks, and the cheeks, rugose; the posterior ocelli nearer to each other than to the eyes. *Thorax:* mesonotum strongly (degree 4) and closely punctate, more closely so along the lines of the notauli, which posteriorly are striato-punctate; the disc of the scutellum shining, with only a few, weak punctures (degree 2); the smooth semicircular area on lateral faces of the scutellum large, reaching clearly beyond half-way up towards base of scutellum; propodeon with a complete, deeply set, U-shaped areola, which is closed across base by one or two weak carinae, the propodeon otherwise shining and virtually unsculptured in the apical half, and dull and rugose in the basal half; costulae not present. *Wings:* 1st abscissa of radial and transverse cubital not strongly angled though their point of junction is easily determinable; the distance from the lowest point of the stigma to the cubital vein 1·45 times the breadth of the stigma; the upper portion of the basal vein very long, equal to or in one specimen rather longer than the apical portion of the 1st abscissa of the cubital, which latter is definitely shorter than the recurrent and twice as long as the pigmented portion of the 2nd abscissa of the cubital; stigma shorter than metacarp. *Legs:* hind coxae basally above punctate (degree 3), on upper half of outer faces smooth and shining save for very widely spaced minute (degree 1) punctation; the longer hind tibial spur half, and the shorter spur one-third, the length of the basal joint of the hind tarsus. *Abdomen:* 1st tergite with its lateral margins more or less parallel in basal half, thence regularly converging to the slightly emarginate apex, its basal breadth 1·5 times its apical breadth, which is two-fifths its median length (18 : 12 : 30), turned over and down and to some extent excavate in the basal half where it is smooth, medianly tumescent, in the apical half punctate or indefinitely sculptured, smooth across extreme apex save that in each apical angle and occupying the lateral thirds of the apical margin there is a large punctiform depression; 2nd tergite with its well-marked discal sulci straight and strongly diverging, so that they are longer than the median length of the disc of the tergite, which is half the basal breadth, which in turn is rather less than half the breadth of the straight or slightly rounded apex (8 : 6 : 12 : 26), the disc of the tergite, as in the succeeding tergites, smooth save for the usual minute punctation; 3rd tergite considerably longer than 2nd (15 : 6); hypopygium membranously acute; ovipositor sheaths rather longer than hind tarsi, straight in basal half, decurved in apical half.

Length, 2·5–3·0 mm.

Assam: Sylhet Dt., 1 ♀, 22.xi.1930 (the *type*), 2 ♀♀, 11.xi.1930 (*M. Bose*). *Type* deposited in the British Museum.

Host unknown: the specimens are labelled "ex unknown creeper."
Cocoons unknown.

This species is distinctive on account of the rugosity on its head. Its position in the genus is shown on page 151.

Apanteles nepitae, sp. n.

♀. Black; the scape to some extent, the four anterior legs (except their coxae), the trochanters, trochantines, and femora of the hind legs, the basal half or two-fifths of the hind tibiae, the ventrites (except for the hypopygium and possibly the apical ventrites), the lateral membranous portions of the 1st and 2nd tergites, the 3rd and 4th tergites, red testaceous; palpi and tibial spurs pale; wings infumated; wing-veins, stigma, and metacarp uniformly brown.

♂. Agrees with the above colour description of the female except that the tergites are more strongly and extensively darkened, and that the hind femora above are darkened at the extreme apex.

♀♂. *Head:* face punctate (degree 2); facial depressions distinctly nearer to apex of clypeus than to the eyes; the frontal orbits to some extent aciculated; the vertex almost pruinose; posterior ocelli nearer to each other than to the eyes. *Thorax:* mesonotum regularly punctate, strongly so (degree 4) anteriorly, thence posteriorly increasingly more weakly, so that in line with the tegulae the punctures are still very well marked (degree 3) but along the posterior margin are minute (degree 1) and very widely spaced; disc of scutellum with a few distinct punctures (degree 2 and 3); propodeon with a smooth, shining, and slightly excavate area occupying the median basal half or two-thirds, which area is bounded apically, that is to say in the apical half of the propodeon, by closely placed, well marked but not strong, acutely U-shaped rugae, and laterally, that is to say in the basal half of the propodeon, on each side by a dull, setiferous, and fairly strongly punctate (degree 3) area that is bigger than itself; this areola extends without interruption to the extreme base of the propodeon where it is entirely smooth; apically, in the bottom of the U, it is indefinitely sculptured, except perhaps in the males which throughout the propodeon are more weakly sculptured. *Wings:* the 1st abscissa of the radial and the transverse cubital evenly rounded, their point of junction absolutely indeterminable; the distance from the lowest point of the stigma to the cubital vein 1·77 times the breadth of the stigma, or half the length of the metacarp; the upper portion of the basal vein, the apical portion of the 1st abscissa of the cubital, the pigmented portion of the 2nd abscissa of the cubital, all about equal; stigma considerably shorter than metacarp. *Legs:* hind coxae basally above with some three or four scattered well-marked (degree 3) punctures, and above apically with some indefinite, setiferous striation and punctation, otherwise above and on upper half of outer faces more or less entirely smooth; the longer hind tibial spur rather longer than half, and the shorter spur rather longer than one-third, the length of the basal joint of the hind tarsus. *Abdomen:* 1st tergite with its lateral margins more or less parallel in basal third or half, thence straight and regularly converging to the truncated apex, its median length one and a half times its basal breadth, and two and a quarter times its apical breadth (28 : 18 : 12), strongly and regularly turned over and down, to some extent excavate basally, its basal two-thirds smooth save for weak striation along the margins, its apical third with striation and widely spaced punctures (degree 3); 2nd tergite with its well-marked discal sulci straight and only slightly diverging so that they are not appreciably longer than the median length of the disc of the tergite, which is shorter than its basal breadth, which in turn is two-thirds the breadth of its virtually straight apex (10 : 10 : 12 : 18), the disc of the tergite virtually smooth, in the female with a transverse row of punctures (degree 2–3) across the apex, but these absent in the male; 3rd tergite longer than 2nd (14 : 10), smooth as are the succeeding tergites; hypopygium large, acute,

strongly chitinised (as opposed to membranous), punctate and noticeably setiferous; ovipositor sheaths apparently not longer than the hind femora.

Length : ♀, 3 mm.; ♂, 2·75 mm.

Ceylon : Peradeniya, 3 ♀♀, 2 ♂♂, 16.xi.1931 (*Dr. J. C. Hutson*).

Type deposited in the British Museum.

Host. This series is labelled to have been bred from the Arctiid moth *Nepita* (or, according to Hampson, *Asura*) *conferta*, Wlk.

Cocoons white : the few that we have were constructed regularly side by side.

The position in the genus of this species is shown on page 151.

Apanteles bordagei, Giard.

Apanteles sp., Giard, 1898, Bull. Soc. ent. France, **1898** : 201.
Apanteles bordagei, Giard, 1902, Bull. d'Agric. coloniale, **1901–1902** : 22. Bordage, 1913, Bull. sci. France Belg., **47** : 384. Box, 1923, Bull. ent. Res., **14** : 133.

This species was originally described (!) from an unstated number of specimens, from Réunion, parasitising the Tineid pest of coffee, *Leucoptera coffeella*, Guér. It was unfortunately omitted from my revision of the Ethiopian species, and my attention was only drawn to this oversight through receiving from one of our correspondents, for naming, some series of an *Apanteles* bred from this particular pest.

I have been in communication with M. Lucien Berland, of the Muséum National d'Histoire Naturelle, Paris, as to the present existence of Giard's types. M. Berland, to whom I am much indebted for the trouble he has taken over this and another matter in connection with this species, replied that "bien entendu les exemplaires correspondants n'existent plus." In this particular instance, however, the non-existence of the type is, luckily, of no great significance, in that I am convinced I have Giard's species before me; the host is correct, the locality sufficiently so, and the few descriptive notes agree.

My redescription is as follows :—

♀. Black; the four anterior legs (save for their coxae), the hind trochantines, the hind femora, at least the basal half of the hind tibiae, and certain portions of the scape, red testaceous; the hind tibiae otherwise, and the hind tarsi, slightly darkened; palpi and tibial spurs pale; costa, stigma, and metacarp, light brown, with the remaining veins even rather lighter; the stigma uniformly opaque.

♀. *Head* more or less throughout with minute (degree 1), regularly spaced punctation; antennae as long as, and in the smaller specimens even rather longer than, the combined length of head, thorax, and abdomen; facial depressions distinctly nearer to apex of clypeus than to the eyes. *Thorax :* mesonotum with rather close, regularly spaced, minute punctation that in certain lights gives the impression of minute rugosity; anteriorly the mesonotum is minutely rugose; the lines of the notauli entirely wanting; disc of scutellum entirely smooth and highly polished, save for two or three minute punctures along each lateral margin in the basal half; the smooth shining area on the lateral faces of the scutellum large but not pointed; the propodeon smooth and shining in the basal half medianly, otherwise punctate, with the areola well indicated in the apical half; the mesopleurae entirely smooth. *Wings :* the transverse cubital straight, rather longer than and not definitely angled with the 1st abscissa of the radial, their point of junction almost indeterminable; the recurrent as long as the 1st abscissa of the radial; the apical portion of the 1st abscissa of the cubital equal to the pigmented portion of the 2nd, rather longer than the upper portion of the basal vein; stigma considerably shorter than metacarp. *Legs :* hind coxae basally above with a few distinct punctures (degree 3), and apically above with a few indistinct punctures (degree 1), the outer faces otherwise entirely smooth; the longer hind tibial spur five-ninths, and the shorter spur three-ninths, the length of the

basal joint of the hind tarsus. *Abdomen:* 1st tergite almost entirely smooth and shining, without median tumescence but with the apical half strongly turned over, parallel-sided in the basal half, thence with the straight sides regularly converging to the truncate apex, the median length of the tergite about 1·5 times its greatest breadth and rather more than twice its apical breadth (16 : 11 : 7); 2nd tergite entirely smooth and shining save for a few minute scattered punctures, strongly transverse, its median length about one-third its own apical breadth and distinctly less than the apical breadth of the 1st tergite (5 : 16 : 7), its well-marked sulci strongly rounded, they being very widely divergent (almost transverse) basally; 2nd suture very fine; 3rd tergite longer than 2nd (7 : 5), with as the succeeding tergites sparse minute punctation; the hypopygium more or less membranous, acute; ovipositor sheaths distinctly shorter than the hind femora.

Length, 1·5–2·0 mm.

Kenya Colony: Kiambu, 14 ♀♀, iii.1931, 15 ♀♀, xii.1931, 9 ♀♀, 1932 (*R. H. Le Pelley*). Tanganyika Territory: Burka Estate, Arusha, 1 ♀, vii.1932 (*A. H. Ritchie*).

Various specimens of these series deposited in the British Museum; others presented to the Muséum National d'Histoire Naturelle, Paris.

Host, as previously stated, the Tineid, *Leucoptera coffeella*, Guér.

Cocoons unknown.

The three species described above, namely *A. rugiceps* and *nepitae*, spp. n., and *bordagei*, Giard, all belong to my Group U and run to couplets 106 and 107 of my key (1932, *Trans. ent. Soc. Lond.*, **80**). These couplets I have had, consequently, to alter, as below; and while working at this portion of the key, I have taken the opportunity of running in a few Palaearctic and Nearctic species that also belong here and had not previously been included.

106. First abscissa of radial and transverse cubital strongly, very definitely angled . . . . . 106*a*.
First abscissa of radial and transverse cubital not strongly angled, usually without definite angulation, often their point of junction quite indeterminable . . . . . 107.

106*a*. Tegulae testaceous (Europe; U.S.A.) . . . . . *falcatus*, Nees.
Tegulae black . . . . . 106*b*.

106*b*. Areola complete and closed basally; the smooth semicircular area on lateral faces of scutellum not reaching half-way up towards base of scutellum (U.S.A.) . . . . . *fumiferanae*, Vier.
Areola only indicated at apex; the smooth area on lateral faces of scutellum reaching at least half-way up towards base of scutellum (India) . . . . . *calycinae*, Wilkn.

107. Tegulae testaceous . . . . . 107*a*.
Tegulae darkened, or black . . . . . 107*b*.

107*a*. Ovipositor sheaths not longer than hind femora (U.S.A.) . *ornigis*, Weed.
Ovipositor sheaths elongate, considerably longer than hind tarsi (India) . . . . . *grandiculus*, Wilkn.

107*b*. Ovipositor sheaths clearly as long as or longer than hind tarsi . . . 107*c*.
Ovipositor sheaths not longer than hind femora . . . . . 107*d*.

107*c*. Frons and vertex rugose (Assam) . . . . . *rugiceps*, Wilkn.
Frons and vertex with only minute punctation (India) *mycetophilus*, Wilkn.

107*d*. Second tergite not strongly transverse, and its sulci straight and only slightly diverging; length 3 mm. (Ceylon) . . . . . *nepitae*, Wilkn.
Second tergite strongly transverse, its sulci rounded, being very widely divergent (almost transverse) basally; length barely 2 mm. (Kenya; Tanganyika; Réunion) . . . . . *bordagei*, Giard.

Apanteles carpata, Say 1836.

Switzerland : Basle, 8 ♀♀, 1933 (*Hans Gisin*).

Host. These females are labelled to have been bred from the clothes-moth, the Tineid, *Tineola biselliella*, Hum.

The present series from Basle agrees perfectly with material of this species in the British Museum. The source of this latter was the Marshall collection ("through C. V. Riley 1888 : U.S. Nat. Mus. Acc.") and also more recent accessions determined in some instances by Gahan and in others by Muesebeck.

This record is not without interest, since *carpata* was not, I think, previously known to occur in Europe. Muesebeck in his revision (1920) states that the species is "widely distributed over at least the eastern half of the United States"; and he gives two Tineid hosts, namely *Tinea pellionella*, L., and *Trichophaga tapetiella*, L.

There is also another *Apanteles* that has been recorded from *T. pellionella*, namely *A. riograndensis*, Brèthes 1920. This species is not represented in the British Museum, but, from the description, is clearly not *carpata*.

Apanteles expulsus, Turner 1918.

Ceylon : Gokarella, 23 ♀♀, 11 ♂♂, 19.x.1932 (*Dr. J. C. Hutson*).

Host. This series is labelled to have been bred from the larva of the Noctuid moth *Amyna punctum*, F., on *Croton tiglium*.

A. expulsus has not previously been recorded from this host, nor so far west as Ceylon, the type series having been bred in Fiji from the Noctuid, *Anticarsia irrorata*, F.

Apanteles heterusiae, Wilkinson 1928.

India : Dehra Dun, 6 ♀♀, 2 ♂♂, 26–29.viii.1933, 7.ix.1933 (*S. N. Chatterjee*).

Host. This series was bred from the moth *Hypsa alciphron*, Cram.

Cocoons pure white.

The type series of *A. heterusiae*, from which alone this species was previously known, was bred in Ceylon from the Zygaenid, *Heterusia cingala*, Moore, and the cocoons were unknown.

Apanteles cocotis, sp. n.

♀. Black; the four anterior legs (except the coxae), the trochanters, femora and tarsi of the hind legs, and the hind tibiae (except for the apical two-fifths which vary from slightly darkened to black) red testaceous; palpi and tibial spurs pale; wings throughout evenly and very distinctly infumated; the stigma, which is uniformly opaque, the wing-veins, and metacarp, dark brown.

♂. Agrees with the above colour description of the female except as follows :—the hind femora to some extent darkened, or even extensively darkened to completely black; the hind tibiae with apical half to three-fifths, the hind tarsi sometimes, the middle femora basally, and the middle trochanters, darkened.

♀♂. *Head :* clypeus, face, frons, and vertex, minutely (degree 1) and evenly punctate throughout; facial depressions apparently equidistant from apex of clypeus and the eyes; the posterior ocelli nearer to each other than to the eyes. *Thorax :* mesonotum strongly and closely punctate (degree 4) in the anterior half and along the lines of the notauli, not quite so closely along the lateral margins, and quite weakly in the posterior half medianly; the lines of the notauli striato-punctate posteriorly; disc of scutellum with a few minute (degree 1) punctures along the margins, otherwise smooth and highly shining; the smooth, semicircular area on the lateral faces of the scutellum large, reaching at least, if not more

than, half-way up towards base of scutellum; propodeon with areola and costulae, otherwise apparently unsculptured; the areola marked throughout length of propodeon, open basally, acutely U-shaped apically, with the more or less horizontal costulae emitted from before its middle, from which point the delimitating carinae converge both basad and apicad. *Wings:* the first abscissa of the radial straight, as long as the breadth of the stigma, nearly twice as long as, and definitely angled with, the transverse cubital (with some thickening at their point of junction), this latter as long as the apical portion of the 1st abscissa of the cubital, two-thirds the length of the recurrent, and longer than the pigmented portion of the 2nd abscissa of the cubital, which is equal to the upper portion of the basal vein; stigma shorter than metacarp. *Legs:* hind coxae shining, basally above with a small group of strong (degree 3–4) punctures, otherwise above and on outer faces with only minute (degree 1) and very sparsely placed punctures; the longer hind tibial spur half, and the shorter spur five-twelfths, the length of the basal joint of the hind tarsus. *Abdomen:* 1st tergite excavate basally, medianly with a well-marked tumescence that is only weakly rugose, otherwise unsculptured, more or less parallel-sided in the basal half, thence very definitely contracted to the truncate apex, the median length of the tergite twice its basal breadth and four times its apical breadth; 2nd tergite with its sulci diverging at an angle not less than 90°, the disc in the female with the basal breadth rather greater than the median length, but only two-thirds the length of the sulci, which latter are rather less than half the apical breadth of the 2nd tergite but equal to the median length of the 3rd tergite (8 : 7 : 12 : 26 : 12), in the male very similar save that the basal breadth equals the median length (6 : 6 : 10 : 22 : 10); 2nd suture virtually straight; 2nd and succeeding tergites with only the usual minute punctation; hypopygium membranously acute; ovipositor sheaths equal in length to the hind tarsi.

Length: ♀, 2·5 mm.; ♂, 2 mm.

Java: Buitenzorg, 5 ♀♀, 4 ♂♂, ii.1933 (*R. W. Paine*).

Type deposited in the British Museum.

Host. This series is labelled as "Parasite Θ," and to have been bred from ♂ coconut flowers.

Cocoons unknown.

This species runs easily in my key (1932, *Trans. ent. Soc. Lond.*, **80**) to couplet 158, which will have to be altered as follows:—

158. Second tergite of ♀ with its lateral sulci longer than its basal breadth (Java) . . . . . *cocotis*, Wilkn.
Second tergite of ♀ with its lateral sulci shorter than its basal breadth 158*a*.

158*a*. Ovipositor sheaths shorter than hind tibiae; hind coxae both above and on outer faces extremely sparsely and minutely punctate (India) *prodeniae*, Vier.
Ovipositor sheaths longer than hind tarsi; hind coxae above minutely and closely punctate and striate, on outer faces extremely sparsely and minutely punctate (Siam) . . . . . *salutifer*, Wilkn.

A. cocotis is, at first sight and apart from colour characters, altogether remarkably like small examples of *A. tirathabae*, Wilkn., a species also recorded in Java on a pest of coconuts. I am able to separate these two *Apanteles*, however, on numerous, though rather critical, structural characters, of which the most convincing are, firstly, the filiform flagellum of the females of *cocotis* as opposed to the short and stout flagellum of those of *tirathabae*, and secondly, the shape of the 2nd tergite. In practice, though *cocotis* will not run in my key to *tirathabae* on account of its testaceous hind femora, another colour character not without importance that easily distinguishes it is its decidedly infumated wings.

Apanteles galleriae, Wilkinson 1932.

MAURITIUS: Rose Hill, 1 ♀, 2 ♂♂, x.1933 (*Dept. of Agric.*).

Host. This series is labelled "ex *Galleria mellonella* from bee-hive."

Apanteles galleriae was originally described from the South of France; its occurrence in Mauritius is of interest.

Apanteles angustibasis, Gah.

Apanteles angustibasis, Gahan, 1925, Philipp. J. Sci., **27**: 85. Wilkinson, 1928, Bull. ent. Res., **19**: 135.

This species was originally described from a single female, received by Dr. Gahan from Mr. C. F. Baker, under his No. 18623, from Mount Maquiling, Luzon, Philippine Islands, which had been bred from the Pyralid, *Cnaphalocrocis medinalis*, Guenée; it was unknown to me at the time that I wrote my revision of the Indo-Australian species of this genus.

Some little time ago Dr. Muesebeck sent me for examination a large collection of MICROGASTERINAE, known as the "Baker Collection" (or a part thereof), amongst which were three specimens that had been determined, I do not know by whom, as *angustibasis*. These, despite the loss of the abdomen in two of the specimens, are certainly all females. All are labelled "Mt. Makiling, Luzon, Baker"; one has a further label, "on *Cnaphalocrocis medinalis*"; and another has "18623," and a red label with "*Apanteles angustibasis* Gahan." They are, therefore, almost certainly of the same series from which the type was described.

I have before me another series of this species that agrees perfectly with Gahan's description and with the three specimens referred to above:—MALAYA: Krian, 7 ♀♀, 3 ♂♂, 13.xii.1933 (*Ent. Div. Agric. Dept.*), ser. no. 9396. These were sent by Mr. Corbett, and had also been bred from *C. medinalis*.

The ♂♂ were not previously known. They differ from the ♀♀, and from Gahan's description, only in their longer antennae.

Gahan failed to notice in his description the flattened nature of this insect, except with regard to the abdomen. Neither did he make any suggestion as to its affinities. It is quite obviously related to *sesamiae* and *flavipes* of Cameron, and consequently is referable to my new Group G erected in this paper and discussed immediately after the following new species.

Apanteles demeter, sp. n.

♀♂. Variable in colour; black; all tibiae testaceous at base, darkened in varying degrees in apical three-fourths; all tarsi, palpi and tibial spurs, testaceous; wings infumated; wing-veins, stigma, and metacarp, brown; three female specimens * with scape and whole of all legs red testaceous.

♀♂. *Head* large, broader than any portion of the mesonotum, in many respects much like the sub-cubical head of *sesamiae*, Cam.; face strongly transverse, prominent, minutely rugose; facial depressions small, clearly nearer to apex of clypeus than to the eyes; frons and vertex with minute punctation, not swollen unduly as in *sesamiae*; antennae of ♀ short and stout, shorter than combined length of thorax and abdomen. *Thorax* compressed dorso-ventrally, wider between the tegulae than thick dorso-ventrally, the mesonotum, scutellum, metathorax, and anterior half of propodeon more or less on the same plane; mesonotum with minute (degree 1), widely spaced punctation, except possibly round the anterior margin; the finely crenulate scutellar sulcus interrupted in the middle by one large

* The testaceous marking of the three specimens may well be due to immaturity; one of the specimens is certainly immature, but the two others do not appear to be so.

punctiform impression; disc of scutellum entirely smooth save for a few minute (degree 1) punctures; propodeon rugose and dull, particularly in the decurved distal portion, smoother and shining in the basal horizontal portion. *Wings* resembling those of *sesamiae*; the 1st abscissa of the radial short, distinctly shorter than and angled with the transverse cubital, with a punctiform 2nd abscissa of the radial at their point of junction; the pigmented portion of the 2nd abscissa of the cubital about equal to the transverse cubital, distinctly longer than the apical portion of the 1st abscissa of the cubital; the distance from the lowest point of the stigma to the cubital vein equal to or less than the breadth of the stigma; stigma rather shorter than metacarp. *Legs:* all femora short and stout, being compressed laterally, the greatest dorso-ventral depth of the hind femora approaching as much as half the length of the hind femora (11 : 26); hind tarsi about equal in length to hind tibiae, possibly just shorter; hind coxae basally above with a small group of fairly strong punctures (degree 3–4) but these often hard to determine, and quite absent in the ♂, otherwise above and on outer faces smooth save for some very widely spaced minute punctures. *Abdomen:* 1st tergite excavate in the basal half, turned over in the apical half, rugose all along the lateral margins, otherwise smooth and shining, its basal breadth half its median length and twice its apical breadth (8 : 16 : 4), the lateral margins straight and regularly converging; 2nd tergite with diverging straight discal sulci whose length is greater than the breadth of the base, but less than the breadth of the apex, of the disc of the tergite (in ♀, 6 : 4 : 8; in ♂, 8 : 4 : 12), the median length of the tergite in the ♀ about half, and in the ♂ greater than half, that of the 3rd tergite (5 : 9 and 7 : 10), and the disc smooth save for some obscure aciculation; 3rd and succeeding tergites smooth save for the usual minute sparse punctation; hypopygium truncate; ovipositor sheaths short.

Length, 1·6 mm.

New Zealand: Bainesse, 5 ♀♀ (one the *type*), undated (*Dr. D. Miller*), 4 ♀♀, 1 ♂, 2.iv.1931 (Coll. *L. J. D.*; per *Dr. D. Miller*).

Type deposited in the British Museum.

Host. Both series are labelled simply "ex Tortrix."

Cocoons white.

On account of its flattened notum and prominent face, and of the short, stout antennae of its females, this new species is obviously related to *sesamiae* and *flavipes* of Cameron. These two latter, together with *ferrugineus*, Mshl., which is also flattened to some extent, belong under the present arrangement to my Group F; two other much flattened species, namely *afer*, Wilkn., and *diatraeae*, Mues., belong respectively to Groups S and U; and *angustibasis*, Gah., which had not previously been placed, is clearly another flattened species closely related to all three. It seems to me to be objectionable for a number of species all possessing a certain particularly striking character to be arbitrarily so widely separated, especially where, as in the case of *afer*, the arbitrary differentiating character is not strongly in evidence; I propose, therefore, to erect for these species a new Group, which I am designating by the letter G.

The following description of this new Group should be interpolated immediately above the description of Group A in my revision of the Ethiopian species of *Apanteles* (1932, *Trans. ent. Soc. Lond.*, **80**: 327):—

Group G.

Thorax compressed dorso-ventrally, wider between tegulae than thick dorso-ventrally; mesonotum, disc of scutellum, metathorax, and at least anterior portion of propodeon, virtually on one plane; face often prominent and strongly transverse; antennae of females often short and stout; ovipositor sheaths variable, usually short . . . . . 204.

To this Group would seem to be referable at present eight species, of which seven are known to me; they are shown in the following key. In our collections awaiting determination is yet another, new, quite distinct species; but this latter is unfortunately as yet too badly represented for me to describe.

204. First abscissa of radial short, clearly shorter than transverse cubital . 205.
First abscissa of radial not unduly short, not shorter than transverse cubital, possibly sometimes equal to it . . . . . 209.
205. Mesonotum with strong, definite, exceedingly well-separated punctation 206.
Mesonotum with only minute punctation, except possibly round anterior margin . . . . . 208.
206. Propodeon with a coarse longitudinal carina at least medianly; mesonotum red testaceous (England) . . . . . *ferrugineus*, Mshl.
Propodeon without such a carina; mesonotum black . . . . . 207.
207. Hind coxae red testaceous; propodeon declivous behind; face prominent (India; Malaya; Formosa; Australia) . . . . . *flavipes*, Cam.
Hind coxae black except at apex; propodeon nearly flat; face not especially prominent (Japan) . . . . . *chilocida*, Vier.
208. First tergite with base decidedly broader than apex, and sides straight and regularly converging (New Zealand) . . . . . *demeter*, Wilkn.
First tergite not so describable (Africa) . . . . . *sesamiae*, Cam.
209. First tergite very narrow, with parallel sides, and with its length at least three times its breadth (Philippines; Malaya) . . *angustibasis*, Gah.
First tergite not so describable . . . . . 210.
210. Second tergite of female with its discal sulci equal to or longer than its basal breadth (Uganda) . . . . . *afer*, Wilkn.
Second tergite of female with its basal breadth twice or approaching twice the length of its discal sulci (West Indies) . . . *diatraeae*, Mues.

A few couplets in the existing key will, of course, have to be altered, as below :—

Couplets 61, 62, 63, and 64 are to be deleted, while the definition of Group F on page 327 should lead to 65 and not to 61 as at present.

It is not proposed to delete couplet 101, if only on account of *calycinae*.

Couplet 176 is to be deleted, while the second portion of couplet 172 should lead to 177.

NEUE STAPHYLINIDEN (COL.) AUS SÜDAMERIKA *

Von Dr. Max Bernhauer.

(*Off. Notar in Horn, Nied. Oesterreich.*)

Leptochirus collenettei, sp. n.

Diese Art ist dem *L. alticola*, Bernh., aus Kolumbien ausserordentlich nahe stehend, lässt sich aber von diesem sofort durch bedeutend kürzere Flügeldecken unterscheiden. Ausserdem ist die Bildung der Mandibeln wesentlich verschieden. An der rechten Mandibel sind der dritte und vierte Zahn breiter und vom zweiten Zahn weniger weit abstehend als dieser vom ersten, an der linken Mandibel sind der vierte und fünfte Zahn sehr klein und stumpf und zu einem schmalen Molarzahn vereinigt. Die Flügeldecken sind kaum so lang als der Halsschild, wie dieser deutlich chagriniert.

Von *brasiliensis*, Bernh., ist die neue Art schon durch die Chagrinierung leicht zu trennen.

Länge : 15 mm. (bei stark ausgezogenem Hinterleib).

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* 35. *Beitrag zur südamerikanischen Staphylinidenfauna.*

Kolumbien: Gorgona Island (On herbage, 24.x.1927), St. George Expedition (*C. L. Collenette*).

In der Sammlung des British Museum und in meiner eigenen.

Bei den folgenden Arten befinden sich die typischen Stücke in denselben beiden Sammlungen.

Bledius withycombei, sp. n.

Dem *B. curtipennis*, Bernh., aus Argentinien am nächsten verwandt, durch etwas andere Färbung, halb so grosse Gestalt sowie durch folgende weitere Merkmale verschieden.

Der Halsschild ist schmäler und länger, kaum breiter als lang, etwas weniger weitläufig punktiert. Die Flügeldecken sind deutlich länger, nach rückwärts etwas erweitert, um ein gutes Stück länger als der Halsschild, etwas feiner und dichter punktiert. Die Fühler sind kürzer und gegen die Spitze stärker verdickt.

Die Färbung ist rötlichgelb, der Halsschild etwas dunkler, die Flügeldecken blass gelb, der Kopf, eine grosse Makel am Hinterrand der Flügeldecken, die Seiten- und Hinterränder der Tergite schwärzlich, die Beine weisslich-gelb.

Länge: 2 mm.

Brit. W. Indies: Trinidad, St. Augustine, 22.xii.1923 (*C. L. Withycombe*).

Osorius guiananus, sp. n.

Diese Art steht dem brasilianischen *O. laeviusculus*, Bernh., infolge der umgemein zarten Punktierung des Halsschildes sehr nahe, ist ihm in Färbung, Gestalt und Grösse ungemein ähnlich, lässt sich von ihm jedoch durch folgende Unterscheidungsmerkmale sehr leicht trennen.

Der Kopf ist stark glänzend, ohne Grundskulptur, viel stärker, vorn weitläufiger, hinten dichter punktiert, in der Mitte mit einer unpunktierten, vorn verkürzten Längszone. Der Clypeus ist ziemlich stark ausgerandet. Die Fühler sind etwas kürzer, die vorletzten Glieder stärker quer. Der Halsschild ist etwas kürzer, nicht ganz so lang als breit, viel stärker glänzend, ohne deutliche Grundskulptur, die Punktierung ist wohl sehr fein, aber doch deutlich stärker punktiert als bei *laeviusculus*, Bernh. Die Flügeldecken sind bedeutend kürzer, kaum länger als der Halsschild, ziemlich dicht und fein gerunzelt und überdies mit einzelnen, oberflächlichen Punkten weitläufig besetzt, wenig glänzend. Der Hinterleib ist stärker und viel dichter und rauher punktiert, weniger glänzend.

Länge: 5 mm. (bei gestrecktem Hinterleib).

Brit. Guiana: Essequibo R., Moraballi Creek. 30.viii.1929 (Oxf. Univ. Expedn.).

Taenodema arrowi, sp. n.

Dem *T. paraguayanum*, Bernh., durch den gestreckten, gewölbten Körper sehr ähnlich, auch in der Färbung kaum verschieden, aber in nachfolgenden Merkmalen verschieden.

Der Kopf ist noch viel dichter punktiert, der spiegelglänzende Querfleck am Scheitel schmäler, der Halsschild kürzer, deutlich etwas breiter als lang, kaum stärker, aber mindestens doppelt so dicht punktiert, die Flügeldecken etwas weniger lang, ähnlich wie bei *paraguayanum* aber deutlich etwas dichter punktiert. Der Hinterleib endlich ist auf der Basalhälfte der einzelnen Tergite viel dichter und auch auf dem bei *paraguayanum* fast ganz unpunktierten Basalteil wohl sehr fein und spärlich, aber immerhin deutlich punktiert. Das erste Fühlerglied ist auf der Unterseite gelblich.

Länge: 16 mm. (bei stark ausgezogenem Hinterleib).

Brasilien: Rio Janeiro, coll. *Sharp.*

In der Sammlung des British Museum und in meiner eigenen.

Lathropinus novus, sp. n.

Von *L. major*, Blanch., dem er am nächsten steht, durch schmälere Gestalt und wesentlich andere Skulptur des Halsschildes auf den ersten Blick zu unterscheiden.

Am Halsschild ist beiderseits neben der Mittellinie die Punktzone mindestens doppelt so breit, die Punktierung an den Seiten viel dichter, die Spiegelflecken weniger ausgedehnt die Punkte selbst viel feiner. Die Punktierung des Kopfes ist ebenfalls feiner und stellenweise zahlreicher. Die Fühler sind etwas kürzer. Die Flügeldecken sind etwas kürzer deutlich etwas kürzer als der Halsschild, feiner und dichter punktiert. Der Hinterleib scheint mir ebenfalls etwas feiner punktiert zu sein.

Länge: 16 mm.

Beim ♂ ist das sechste Sternit halbkreisförmig ausgeschnitten, vor dem Ausschnitt niedergedrückt und geglättet, das fünfte in der Mitte des Hinterrandes schwach ausgeschnitten und vor dem Ausschnitt ziemlich lang eingedrückt.

Brasilien: Villa Nova.

Paederus ecuadorensis, sp. n.

Von *P. cyanipennis*, Guér., in nachfolgenden Punkten verschieden. Der Kopf ist viel schmäler und länger, deutlich länger als breit, nach rückwärts stärker und geradliniger verengt, mit noch flacher verrundeten Hinterecken, die Punktierung ist feiner und etwas dichter. Der Halsschild ist an den Seiten weniger gerundet, feiner und weniger weitläufig punktiert. Die Fühler sind beträchtlich feiner und viel dichter punktiert.

Im Übrigen ist die Ähnlichkeit in Gestalt, Färbung und Grösse eine sehr grosse. Die Flügeldecken sind lebhaft metallisch blau bis blaugrün gefärbt.

Länge: 9 mm. (bei ziemlich eingezogenem Körper).

Ecuador (*Gilbert Hammond*), 1920.

Astenus rufulus, sp. n.

Eine durch die breitere parallele Gestalt, die Färbung und kurze Flügeldecken kenntliche, mittelgrosse Art.

Rötlichgelb bis gelbrot, matt, die Fühler und Beine blassgelb. Der Kopf ist so breit als der Halsschild, viel länger als breit, mit mässig groben, flacken Augenpunkten sehr dicht besetzt. Die Fühler sind gestreckt, die vorletzten Glieder mehr als doppelt so lang als breit. Der Halsschild ist so breit als die Flügeldecken, um ein Viertel länger als breit, an den Seiten mässig gerundet, mit wenigen dunkeln Borstenhaaren, jederseits der Mitte mit einem seichten, grossen Eindruck, ähnlich wie der Kopf skulptiert. Die Flügeldecken sind etwar kürzer als der Halsschild, viel länger als zusammen breit, kräftig und dicht, etwas rauh punktiert. Der Hinterleib ist mässig stark und dicht punktiert, etwas glänzender als der übrige Körper, wie dieser gelb, aber dichter behaart, mit wenigen Seitenborsten.

Länge: 4·3–5 mm.

Brasilien: Rio de Janeiro, Sao Paulo; Argentinien: Misiones (Lorelo) (*Dr. A. A. Ogloblin*).

Dibelonetes bicoloripes, sp. n.

In der Körpergestalt dem *D. latemarginatus*, Bernh., sehr ähnlich, durch ganz andere Färbung, schmäleren Halsschild, breiteren Kopf und dichtere Skulpture leicht zu unterscheiden.

Rostrot, die Flügeldecken an den Seiten und der Hinterleib vor der Spitze angedunkelt, der Hinterrand der Flügeldecken, die Fühler, der Mund und die Beine blassgelb, die Schenkel an der Spitze breit geschwärzt. Der Kopf ist viel breiter als der Halsschild, so breit als die Flügeldecken, länger als breit, mit Augenpunkten sehr dicht besetzt, die beiden Zähnchen der Oberlippe lang, stachelartig. Die Fühler gegen die Spitze nicht verdickt, die vorletzten

Glieder um die Hälfte länger als breit. Der Halsschild ist viel länger als breit im ersten Drittel am breitesten, nach vorn stärker, nach ruckwärts etwas schwächer, geradlinig verengt, ähnlich wie der Kopf skulptiert. Die Flügeldecken sind deutlich länger als der Halsschild, etwas länger als zusammen breit, kräftig und dicht punktiert stärker glänzend als der übrige, ziemlich matte Körper. Der Hinterleib ist sehr fein und sehr dicht punktiert. Der Körper ist gelblich behaart, an den Seiten mit einigen schwarzen Borsten.

Länge: 3·5 mm.

Brasilien: Santa Rita (August), Rio de Janeiro (*Squires*).

Medon (s. str.) chilensis, sp. n.

Dem *M. obscuriventer*, Fairm. et Germ., sehr nahe stehend, um die Hälfte kleiner, durch viel kürzeren Kopf und Halsschild, sowie besonders durch die bedeutend kürzeren Flügeldecken sofort zu unterscheiden.

Rostrot, glänzend, der Hinterleib pechbraun bis pechschwarz. Der Kopf ist fast breiter als der Halsschild, nicht länger als breit, kräftig und nicht allzu dicht punktiert. Die Fühler sind schnurförmig, die vorletzten Glieder breiter als lang. Der Halsschild ist etwas schmäler als die Flügeldecken, etwas länger als breit, nach rückwärts schwach verengt, ähnlich wie der Kopf punktiert mit geglätteter, mässig breiter Mittelzone. Die Flügeldecken sind kaum länger als der Halsschild, nach rückwärts deutlich erweitert, etwas weniger stark als der Halsschild und etwas dichter punktiert. Der Hinterleib ist sehr fein und dicht punktiert, wie der übrige Körper, jedoch dichter gelblich behaart.

Länge: 3·2 mm.

Chile (ohne näheren Fundort, ex coll. Sharp).

Scopaeus brasiliensis, sp. n.

Von den argentinischen Arten *S. lugubris*, Lynch, und *S. frater*, Lynch, leicht durch den nach hinten nicht erweiterten, sondern volkommen parallelen Kopf zu unterscheiden.

Heller oder dunkler pechschwarz, matt, dicht gelblich behaart, die Fühler, der Mund und die Beine rostrot. Der Kopf so breit als der Halsschild, länger als breit, vollkommen gleichbreit, äusserst fein aber doch deutlich und äusserst dicht chagrinartig punktiert. Die Fühler sind beträchtlich gestreckter als bei *lugubris*. Der Halsschild ist dem des *lugubris* ausserordentlich ähnlich und ebenso dicht, aber feiner punktiert, die Punktierung ist fast chagrinartig, aber immerhin deutlicher als bei *frater*. Die Flügeldecken sind länger als bei *lugubris*, ebenso dicht aber etwas feiner punktiert. Der Hinterleib ist kaum verschieden.

Länge: 3·7–4 mm.

Brasilien: Rio de Janeiro (*Squires*).

Cryptobium (Pycnocrypta) quadratipenne,* sp. n.

Von dem verwandten *C. gigas*, Sharp, durch viel geringere Grösse, rötlichgelbe Hinterleibsspitze, und kräftigere Punktierung des Kopfes gewiss verschieden.

Schwarz, die Hinterleibsspitze hell rötlichgelb, die Beine pechfarben. Der Kopf ist viel breiter als der Halsschild, so lang als breit, rundlich, matt chagriniert, ausserhalb der unpunktierten Mittelzone, kräftig und weitläufig punktiert. Die Fühler sind pechschwarz, gegen die Spitze heller, die vorletzten Glieder viel länger als breit. Der Halsschild ist viel schmäler als die Flügeldecken, fast um die Hälfte länger als breit, an den Seiten sanft gerundet, so wie der Kopf ganz matt chagriniert, vor dem Schildchen mit zwei Längseindrücken, zwischen diesen mit einer deutlich glänzenden Schwiele, längs der Mitte un-

* Mit dieser Art nahe verwandt ist eine zweite brasilianische Art (*mrazi*, Ramb.), welche sich durch schwarze Hinterleibsspitze, gelbrote Flügeldecken, rötlichgelbe Beine, an denen nur die Spitze der Schenkel und ein Teil der Schienen gebraunt sind, und durch viel feinere Punktierung des Kopfes leicht unterscheiden lässt. Petropolis (*Mraz*).

punktiert, sonst weniger kräftig und viel flacher und unbestimmter als der Kopf punktiert. Die Flügeldecken sind quadratisch, mit vorstehenden Schulterecken, mässig stark und dicht punktiert, stärker glänzend als der Vorderkörper. Der Hinterleib ist fein und weitläufig punktiert, mässig glänzend. Die Vorderschienen sind an der Spitze dicht goldgelb behaart.

Länge: 10–12 mm.

Brasilien: Rio de Janeiro (*Squires*), Petropolis (*F. Sahlberg*).

Cryptobium hastiventre subsp. **arrowi**, subsp. n.

Von dem in Argentinien häufig vorkommenden *C. hastiventre*, Bernh., unterscheidet sich diese in Brasilien vorkommende Form im Wesentlichen nur durch robustere Gestalt und beträchtlich kürzere Flügeldecken, welche um ein gutes Stück kürzer sind, als der Halsschild. Da aber *hastiventre* nach dem vorliegenden Material eine immerhin recht variable Art ist, möchte ich vorläufig vorstehende Form nicht als selbstständige Art ansprechen.

Länge: 4·5 mm.

Brasilien, ohne näheren Fundort.

Cryptobium parvipenne, sp. n.

In der Gestalt, Grösse und Färbung dem *C. antiquum*, Er., sehr ähnlich jedoch auf den ersten Blick durch die starke Punktierung und den Glanz des Kopfes zu trennen.

Der Kopf ist so breit als der Halsschild, länger als breit, eiförmig, mit flach verrundeten Hinterecken, kräftig und dicht, zwischen und vor den Augen weitläufig punktiert, nicht chagriniert, stark glänzend. Der Halsschild ist kaum schmäler als die Flügeldecken, beträchtlich länger als breit, längs der Mitte breit geglättet, sonst kräftig und ziemlich dicht, fast gleichmässig punktiert. Die Flügeldecken sind viel kürzer als der Halsschild, nach hinten deutlich erweitert, weniger kräftig aber viel dichter als der Halsschild punktiert. Der Hinterleib ist mässig fein und dicht punktiert.

Länge: 10 mm.

Beim ♂ ist das sechste Sternit tief und ziemlich schmal dreieckig ausgeschnitten, neben dem Ausschnitt niedergedrückt und geglättet.

S. Amerika: ohne nähere Angabe, ex coll. Sharp, zweifellos aus Brasilien stammend.

Cryptobium plagicolle, sp. n.

Aus der nächsten Nähe des *C. prolixum*, Er., durch die Skulptur des Halsschildes von ihm leicht zu unterscheiden. Von *C. pseudoprolixum*, Bernh., ebenfalls leicht durch viel schmälere Gestalt, viel ausgedehnteren Spiegelfleck am Halsschild und viel längere Flügeldecken zu trennen.

Schwarz, ziemlich glänzend, die Fühler, Taster und Beine bräunlich-rot, die Schenkel mit Ausnahme der äussersten Spitze blassgelb. Der Kopf ist kaum breiter als der Halsschild, gestreckt, viel länger als breit, parallelseitig mit ganz flach verrundeten Hinterecken, stark und dicht, zwischen und vor den Augen nur einzeln punktiert, in der Mitte zwischen den Augen mit einer kurzen Längsfurche, vor dieser mit zwei Längseindrücken; die Augen liegen im ersten Drittel des Kopfes. Die Fühler sind etwas kürzer als bei *pseudoprolixum*. Der Halsschild ist beträchtlich schmäler als die Flügeldecken, um ein Drittel länger als breit, ziemlich gleichbreit, längs der Mitte breit geglättet mit zwei dicht punktierten Punktreihen, neben diesen vom ersten Drittel bis zum Hinterecken mit einem nach hinten erweiterten Längsspiegelfleck, welcher hinten durch zwei Punkte unterbrochen ist, sonst kräftig und dicht punktiert. Die Flügeldecken sind viel länger als der Halsschild, gleichbreit, viel länger als zusammen breit, stark und dicht, gleichmässig punktiert. Der Hinterleib ist mässig fein und ziemlich dicht, hinten weitläufiger punktiert.

Länge: 11 mm.

Brasilien: Rio de Janeiro (*Squires*), ex coll. Sharp.

Cryptobium angustulum, sp. n.

Mit *C. pseudoprolixum*, Bernh., noch näher verwandt, von ihm und den übrigen Verwandten durch schmälere Gestalt, vom erstgenannten ausserdem durch den nach hinten nicht erweiterten Kopf und die viel feinere und dichtere Punktierung des ganzen Körpers und längere Flügeldecken verschieden.

Der Kopf ist etwas breiter als der Halsschild, oblong, gleichbreit, nach ruckwärts eher etwas verengt, mit wenig flach verrundeten Hinterecken, mässig stark und dicht, zwischen und vor den Augen spärlich punktiert, im Grunde auf der vorderen Hälfte äusserst fein, aber deutlich chagriniert. Die Augen liegen im vorderen Drittel. Die Fühler sind kürzer als bei *pseudoprolixum* die vorletzten Glieder nur wenig länger als breit. Der Halsschild ist viel schmäler als die Flügeldecken, um gut ein Drittel länger als breit, ausser der glatten Mittelzone kräftig und dicht punktiert, mit einer langen, schmalen, erhobenen Spiegelschwiele. Der Flügeldecken sind beträchtlich länger als der Halsschild, gleichbreit, viel länger als zusammen breit, weniger stark und noch dichter als der Halsschild punktiert. Der Hinterleib ist fein und ziemlich dicht punktiert.

Länge: 9 mm. (bei gestrecktem Körper).

Beim ♂ besitzt das zweite Sternit vor der Mitte des Hinterrandes eine spiegelglänzende, im Basalteil gefurchte Querbeule, das dritte ist in einen langen, mässig breiten, hinten verschmälerten und an der Spitze dicht bevorstehen Lappen ausgezogen.

Brasilien (ohne näheren Fundort), ex coll. Sharp.

Cryptobium subaeneipenne, sp. n.

Ganz von der Gestalt und auch von der Grösse des *C. alternans*, Sharp, aber durch andere Färbung und stärkere und weitläufigere Punktierung des Vorderkörpers verschieden.

Der Kopf ist deutlich kürzer, kaum merklich länger als breit, stärker und weitläufiger punktiert, die Stirn weniger matt chagriniert. Der Halsschild ist ebenfalls kürzer, nur mässig länger als breit, deutlich stärker und weitläufiger punktiert. Die Flügeldecken sind etwas länger, grösser und weitläufiger punktiert, neben dem Seitenrand mit scharfer Kiellinie. Die Färbung ist ziemlich verschieden. Der Körper ist einschliesslich des Halsschildes und des Hinterleibes schwarz, die Flügeldecken nur mit geringem Erzglanz, mit ziemlich breitem rötlichgelbem Hinterrand, die Hinterränder der Hinterleibsringe sind schmal rötlich, die Fühler zum Teile etwas gebräunt.

Länge: 8 mm. (bei gestrecktem Körper).

Brasilien (ohne nähere Fundort Angabe), ex coll. Sharp.

Cryptobium trinidadense, sp. n.

Dem *C. rostratum*, Sharp, in der Gestalt ausserordentlich ähnlich, durch die Färbung und viel feinere und dichtere Punktierung das ganzen Körpers auf den ersten Blick zu unterscheiden.

Bräunlichrot, der Halsschild rötlichbraun, der Kopf und die Flügeldecken pechschwarz, der schmale Hinterrand der Flügeldecken, der vorderste Teil des Kopfes, die Taster und Beine rötlichgelb, die Fühler braünlich, die Wurzel und Spitze gelblich. Der Kopf ist etwas schmäler als der Halsschild, viel länger als breit, hinter den in der Mitte der Seiten gelegenen Augen unmerklich erweitert, fein und sehr dicht, zwischen und vor den Augen stärker und viel weitläufiger punktiert, daselbst glänzend, hinten matt, vor dem Vorderrande äusserst zart chagriniert. Die Fühler sind gestreckt, die vorletzten Glieder viel länger als breit. Der Halsschild ist viel schmäler als die Flügeldecken, um ein Drittel länger als breit, vor der Mitte schwach erweitert, ausserhalb der breiten, erhabenen spiegelglänzenden Mittelzone ziemlich kräftig und dicht, etwas ungleichmässig punktiert glänzend. Die Flügeldecken sind beträchtlich länger als der Halsschild, mässig stark und sehr dicht

punktiert, wenig glänzend, neben dem Seitenrande ohne Kiellinie. Der Hinterleib ist äusserst fein und dicht, fast chagrinartig punktiert.

Länge: 5·5 mm.

Beim ♂ ist das sechste Sternit in der Mitte des Hinterrandes breit dreieckig ausgerandet.

TRINIDAD: St. Augustine, 15.iv.1926 (*C. L. Withycombe*).

Cryptobium bisulcatum, sp. n.

In die Gruppe des Vorherigen gehörig, von den verwandten Arten durch die furchenartig vertieften Dorsalpunktreihen des Halsschildes verschieden.

Pechbraun bis pechschwarz, der Mund und die Beine rötlichgelb, die Fühler rostgelb, teilweise angedunkelt. Der Kopf wie beim vorigen, hinten vollkommen parallelseitig viel stärker und viel weitläufiger punktiert, ziemlich stark glänzend. Die Fühler sind entschieden kürzer, die vorletzten Glieder fast breiter als lang. Der Halsschild ist kürzer, zu beiden Seiten der glatten Mittelzone mit je einer vertieften, dicht punktierten, kräftigen Dorsalreihe, seitwärts kräftig, weitläufig und unregelmässig punktiert, neben den Dorsalreihen mit einer langen glänzenden Längsschwiele. Die Flügeldecken nur mässig länger als der Halsschild, etwas stärker und weniger dicht als beim Vorigen punktiert. Der Hinterleib ist ähnlich skulptiert.

Länge: 5·5 mm.

Beim ♂ ist das sechste Sternit breit dreieckig ausgeschnitten.

BRASILIEN: Rio de Janeiro (*Squires*), ex coll. Sharp.

NOTE ON A "MEALYBUG" WRONGLY ATTRIBUTED TO *PSEUDOCOCCUS BROMELIAE*, BOUCHÉ

By E. ERNEST GREEN, F.R.E.S.

Pseudococcus cannae, nom. n.

Pseudococcus bromeliae, Green (*nec* Bouché), 1922, *Cocc. Ceyl.*, **5**: 383, text-fig. 1. (See also Appendix, p. 462.)

The name *bromeliae*, Bouché, having been shown to have no standing, as applied to the "Mealybug" of the pineapple, that insect has now been referred to *brevipes* of Cockerell (1893), which appears to be the first name that is properly applicable to the species.

Several nearly allied species have been confused under the older (discarded) name, amongst which is the insect described and figured by me in *Cocc. Ceyl.*, *loc. cit.* This insect differs from *brevipes* in having limbs and antennae markedly more slender. The cerarii are less pronounced and the cerarial pores less concentrated. The dorsal ostioles are larger and more conspicuous than in typical *brevipes*.

As this insect has been wrongly attributed to *bromeliae*, which name is no longer permissible in the genus, it will be necessary to provide it with a new specific name. I accordingly propose to rename it *Pseudococcus cannae*.

CEYLON: Peradeniya, on roots of *Canna* and *Impatiens*. Dr. H. Priesner reports that he has found the same species in Egypt.

Since the completion of my work on "The Coccidae of Ceylon" I have received, from Mr. J. C. Hutson, genuine examples of *brevipes*, Ckll., taken on roots and foliage of pineapple at Peradeniya.

LIFE-HISTORIES OF SOME NEW ZEALAND LEPIDOPTERA, WITH NOTES ON THE MALE GENITALIA AND LARVAL CHAETOTAXY

By A. V. Chappell

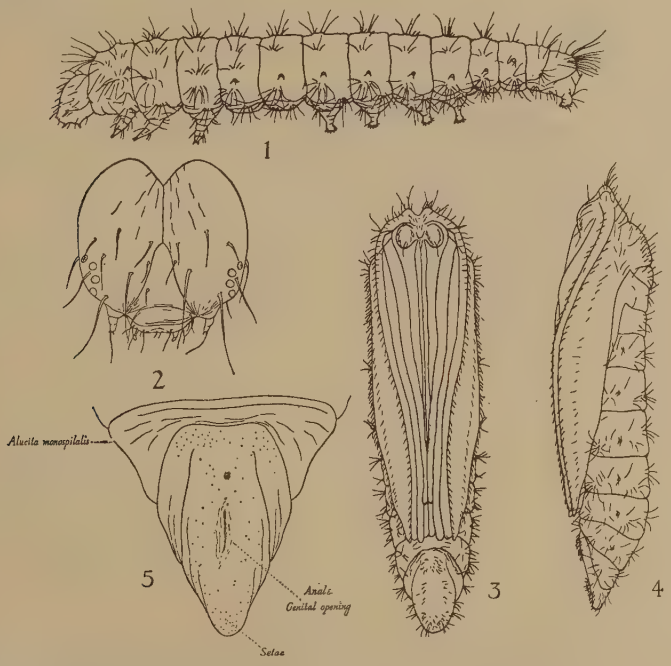
(*Cawthron Institute, N.Z.*)

Life-histories

1. *Alucita monospilalis*, Wlk. (Pterophoridae).

Aciptilia patruelis, Feld; *A. monospilalis*, Meyr; *A. lycosema*, Meyr.

Egg:—Elliptical; flattened; slight honeycomb effect on flat upper surface; very pale delicate green.



Figs. 1–5.—*Alucita monospilalis*. Fig. 1—larva, lateral aspect; fig. 2—do., head frontal aspect; fig. 3—pupa, ventral aspect; fig. 4—do., lateral aspect; the many very small setae are not shown in the figure; fig. 5—do., abdominal extremity, ventral aspect; cremastral setae represented by dots; coalescence of genital and anal openings has occurred; the black patch above the G. + A. opening marks a slight depression not invariably present.

Mature larva:—13 mm. long; gradually tapering posteriorly; dorso-ventrally compressed, the ventral surface flat; 14 apparent segments; 16 legs; spiracles borne at ends of short protuberances. Head whitish with pale ochreous-brown markings on crown and

sides, mouth-parts pale brown, ocelli brownish or reddish. Body semi-transparent, of a pale slightly yellowish delicate green through which the darker green alimentary canal is visible; the ventral surface much paler than the dorsal, being rather whitish. Variation in the intensity of green is but slight; some specimens slightly marked with black on anterior dorsal region, and flecked with pinkish or pale mauve. Setae numerous, arising from regular series of small verrucae; dorsal setae red-brown, the others white. Larvae obtained in September; several broods in a year.

Larval habits:—Diurnal; very sluggish; apparently no attempt at concealment; feeds on upper epidermis and fleshy tissue of leaves of Ivy (*Hedera helix* (?)).

Immediately preparatory to pupation an elongate oval mat of fine white silk is spun on either surface of a leaf, and to this mat the larva clings firmly, gripping with its prolegs only. The thoracic legs are held in a rigid position, sloping forward, against the body. The head, retracted slightly, is pressed well down against the leaf thus giving the larva a hump-backed appearance. Larva becomes whitish-green, frequently marked with pinkish-mauve.

Pupa:—Attached by cremaster, usually head downwards, to the silken mat. 10 mm. ong; very pale green; whitish on wings and ventral portions. A conspicuous black dorsal mark is often present on lower thorax. Frequently marked with pinkish-mauve. Numerous setae, those on dorsal and lateral surfaces golden-brown, those on ventral surface white.

A study of the life-history and the genitalia of *A. lycosema* definitely shows that this moth cannot be regarded as a distinct species; it is merely a form of the extremely variable *A. monospilalis*. This supports Hudson's view (1928), based on the fact that the alleged species were captured "in coitu."

Philpott (1928) working on the genitalia treated the two extreme forms as separate species, and his figures show sufficient differences to justify his views. Nevertheless, the figures of the genitalia given in this paper and labelled for convenience as *A. monospilalis* and *A. lycosema* were prepared from Philpott's specimens, the complete organs being from moths he collected and the dissected parts from his slides containing the specimens he figured. The figures herein given differ from Philpott's and do not show sufficient differences to warrant separation of the forms; they show marked similarity in certain respects.

The reason for Philpott's misinterpretation was due to the fact that his figures were, I believe, drawn as the specimens floated in glycerine preparatory to mounting. This would account for the difference between his figures and mine. Further specimens were taken from Philpott's collection, the genitalia dissected and studied while floating in glycerine. By manipulation of the parts, positions were obtained which showed whence Philpott derived his figures; this was particularly noticeable as regards the aedeagus which displays probably the most radical difference in Philpott's figures.

Though it is recognised that with mounted specimens there is a possibility of distortion caused by the pressure of the cover-slip, the nature of the parts is usually such that great distortion is seldom possible; careful study before mounting together with checking with unmounted specimens will show which parts would become distorted and eliminate the possibility of serious error.

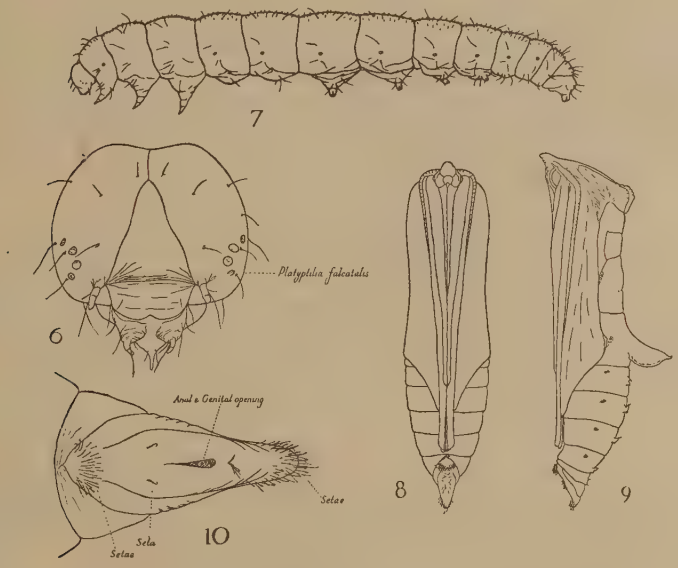
Besides the evidence afforded by the genitalia, there is complete similarity in all stages of the life-history and in habits, etc., of the two forms. Furthermore the eggs laid by one female, of either form, will give rise to progeny varying from one extreme to the other. In a long series the variation from the pure-white extreme, *A. monospilalis*, to the brown-marked extreme, *A. lycosema*, is usually gradual and easily traceable.

The genitalia and life-history evidence given above is sufficient, I think, to

show irrefutably that *A. lycosema*, Meyr., must be regarded as a synonym of *A. monospilalis*, Wlk.

2. *Platyptilia falcatalis*, Wlk. (Pterophoridae).

Mature larva:—13 mm. long; 14 apparent segments; 16 legs; spiracles borne at ends of short protuberances. Head very pale ochreous marked with pale brown. Body pale yellow-green, more yellowish on anterior segments; segment 2 has a yellowish dorsal region, the yellow thereof being slightly darker than that elsewhere; semi-transparent on dorsal surface of central segments. Irregular, cloudy, reddish dorsal line beginning on segment 3, faint on central segments; two irregular pale whitish sub-dorsal lines, merging here and there. Spiracles ringed with black. Stout brown setae, not numerous, multitude of small bristles on dorsal region. The ventral surface is transparent and rather greener than upper surfaces; thoracic legs brown. Some larvae are much greener than others; dorsal line sometimes very dark. Larvae obtained in October.



Figs. 6–10.—*Platyptilia falcatalis*. Fig. 6—larva, head, frontal aspect; fig. 7—do., lateral aspect; fig. 8—pupa, ventral aspect; fig. 9—do., lateral aspect; fig. 10—do., abdominal extremity, ventral aspect; coalescence of the genital and anal openings has occurred; the depression marked below the G. + A. opening is not always present.

Larval habits:—Diurnal; feeds within terminal leaf-buds of *Hebe salicifolia*, leaving outer leaves uneaten; changes to another bud when food-supply in one has been exhausted; attacked leaf-buds easily discernible owing to brown region spreading from entrance-hole made by the larva.

Immediately preparatory to pupation the head is retracted and the anterior segments are humped considerably.

Pupa:—Suspended head downwards, at an angle of about 30 degrees from the surface of

attachment, from a small oval mat of fine silk spun on a twig or leaf. Peculiar shape; two coloration types which have no sexual significance.

Type A :—10 mm. long; light, slightly yellowish, green; capital projection slightly brownish; thoracic dorsal humps pale brown; abdominal dorsal projections brown, rather darker diagonal line, fading gradually, running upwards on lateral surface from base of each projection; short diagonal brown line running across lateral and subdorsal surfaces; narrow brown region extending a short distance below and a considerable distance above the thoracic dorsal humps; darker green dorsal line, fading gradually towards thorax, on abdominal segments; series of small abdominal dorsal projections, below the large projections, ochreous tipped with brown; rather more yellowish lateral line on abdominal segments, extending from wings down; wings, legs, etc., rather paler than rest of body; diagonal marks of upper abdomen continued on to wings; spiracles whitish; legs pale anteriorly, whitish towards extremities; abdominal extremity very pale ochreous, becoming brown on dorsal surface and on very tip; cremastral setae golden, becoming brown on extremities. Wings, legs, etc., become very pale brown, darken and gradually assume the imaginal colouring.

Type B :—10 mm. long; rather darkish brown (a very similar colour to that of dry dead *Hebe* leaves); strongly tinted with dull reddish, especially on thorax and portions of wings; traces of dull brownish-green on dorsal surface of upper abdomen; thoracic dorsal hump slightly ochreous on outer edge; very pale pink region extending from bases of large abdominal dorsal projections to spiracles; upper surfaces of these projections very dark; small abdominal dorsal projections ochreous towards extremities and tipped with brown; spiracles whitish. Wings, legs, etc., darken and the whole gradually assumes imaginal colouring.

3. *Nymphostola galactina*, Feld. (Oecophoridae).

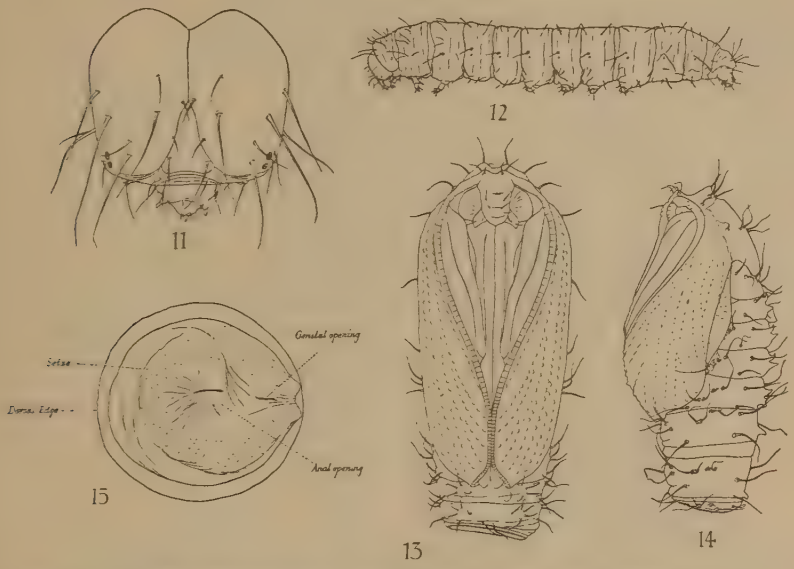
Mature larva :—22 mm. long; 14 apparent segments; 16 legs. Head slightly yellowish-green, marked with black. Body rather light dull green; alimentary canal faintly visible; slightly darker green dorsal region; two dorsal series of small, faint, cloudy blackish patches, the patches being situated on the segmental divisions; two dorsal series of black spots from which rise, singly, fine black setae; two lateral series of similar spots from which rise, again singly, fine, fairly long whitish setae; fine whitish setae on lower lateral and on ventral surfaces; spiracles white, faintly and finely ringed with brownish; some of segmental divisions very faintly yellowish; ventral surface silvery-green. Larvae obtained in October.

Larval habits :—Diurnal; fairly active; draws the edges of a leaf together very slightly and spins an extensive double-sheeted web across the hollow; dwells between upper and lower sheets of web, eating surrounding leaf or going abroad to feed; when disturbed writhes and wriggles in the same manner as a typical Tortricid larva.

Food-plant :—Ivy (*Hedera helix* (?)).

Pupa :—8 mm. long; of peculiar shape; suspended head downwards from a large thick silken mat. Very shiny; ventral thoracic surface—pale rather whitish-green; eyes deep mauve; antennae pale black towards extremities, remaining portions have pale black segmentation only; legs, etc., marked irregularly with dull golden-brown and, in places, with pale blackish; veins of wings bear numerous small, conical, golden-brown projections tipped with dark brown; veins marked with small golden-brown patches, roughly elliptical, becoming slightly larger and, in many cases, turning dark brown towards the termen; extremities of 1st pair of legs deep blackish-purple; ventral abdominal surface—dull light green, marked and patched with dull brown and golden-brown; segmental membranes ochreous; anal segment silvery; the remaining two segments each bear a narrow, elongate hump extending right across the ventral surface; lateral and dorsal surfaces silvery;

slightly tinged with very delicate blue on lateral surface of abdominal segments 4, 5 and 6; membranes of abdominal segments 5–6, 6–7, 7–8 light green; spiracles silvery; on abdominal segments 2–5 is a dorsal series of fairly large horn-like projections, two per segment; on each of abdominal segments 6 and 7 is a single slight horn-like projection; numerous long setae, twisted and bent; those on head and ventral surface dark brown, those on



Figs. 11–15.—*Nymphostola galactina*. Fig. 11—larva, head, frontal aspect; fig. 12—do., lateral aspect; fig. 13—pupa, ventral aspect; fig. 14—do., lateral aspect; fig. 15—do., disk-like abdominal extremity from beneath; cremastral setae represented by dots.

lateral and dorsal surfaces silvery; abdominal extremity flat and disk-like; cremastral crochets arranged in roughly circular fashion.

Hudson (1928) places this species in the Tineidae, but I prefer to follow Philpott (1927) who assigns it to the Oecophoridae.

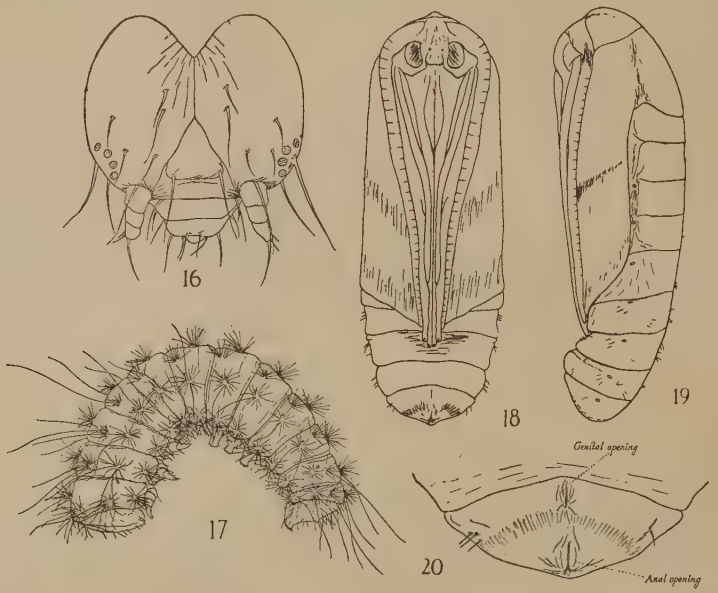
4. *Celama parvitis*, Howes (Nolidae).

Mature larva:—9 mm. long; 14 apparent segments; head considerably retracted into 2nd segment; slightly horny dorsal plate on segment 2; spiracles slightly protuberant; 16 legs. Head ochreous. Body very pale pink, irregularly clouded with slightly darker pink; broad chinese-white dorsal line, broadly and irregularly edged with deep pink; the dorsal line is continued across the dorsal plate, which is ochreous on posterior portions, on segment 2; the pink merges gradually into a broad brown dorsal and subdorsal region; this region is tinged here and there along the irregular lower edge with the same deep pink and bordered with pale white. Setae numerous, arising thickly from regular series of low hemispherical verrucae; setae,—some white, others darkish brown, some darkish brown towards tips; the variously coloured setae are mixed indiscriminately; number of long

darkish brown setae, rising from amid the shorter ones, on anterior and posterior segments. The appended table gives the lengths of the various setae.

1.	Long anterior setae . . .	8·6 mm.
2.	Long posterior setae . . .	6·8 mm.
3.	Longest of short setae . . .	1·0 mm.

Spiracles lightish brown. Lower lateral region is a slightly darker pink than that on other portions of body; ventral surface white slightly tinted with pink. Larvae obtained in October.



Figs. 16–20.—*Celama parvitis.*—Fig. 16—larva, head, frontal aspect; fig. 17—do., lateral aspect; fig. 18—pupa, ventral aspect; fig. 19—do., lateral aspect; fig. 20—do., abdominal extremity, ventral aspect.

Larval habits:—Diurnal; sluggish; seemingly no attempt at concealment; feeds chiefly on under surfaces of leaves.

Food-plant:—*Helichrysum glomeratum*; will also feed, in captivity, on an introduced species of *Senecio*.

Cocoon:—Small and compact; rather elongate; roughly club-shaped; greyish-white; of silk and tomentum from undersides of leaves of food-plant; the colouring corresponds fairly closely to that of the tomentum on the leaves; usually constructed on under surface of a leaf, stem of club towards leaf-petiole.

Preparatory to pupation the larva becomes very pink.

Pupa:—Lies in cocoon with head uppermost. 5 to 7 mm. long; golden-brown; wings darken gradually; oblique line on fore-wings becomes clearly visible.

(*To be continued.*)

LIFE-HISTORIES OF SOME NEW ZEALAND LEPIDOPTERA, WITH NOTES ON THE MALE GENITALIA AND LARVAL CHAETOTAXY

(*Continued*)

By A. V. Chappell.

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Notes on the Male Genitalia.

In general the terminology of the genitalia employed in this paper is similar to that used by Philpott who has carried out extensive studies on certain New Zealand families and genera.

The main body of the intromittent organ is herein regarded as the " aedeagus," of which the eversible bag-like portion, whatever form it may take, near or forming the posterior extremity, is termed the " vesica." When chitinisation of the terminal portion of the " ductus ejaculatorius " has occurred, this chitinised portion is called the " penis."

The " ductus ejaculatorius " is considered purely as the semen-conveying tube or vessel leading down to the extremity, constituted by the vesica or the penis as the case may be, of the aedeagus. The " orifice " is the opening to permit the extrusion of the vesica and the penis. The anterior end of the vesica is attached to the rim of the orifice.

The lettering for the figures is as follows :—

Ae. . . .	aedeagus.	Or. . . .	orifice.
Cl. . . .	clavus.	P. . . .	penis.
De. . . .	ductus ejaculatorius.	R.H. . . .	right harpe.
E.Sa. . . .	extension of sacculus.	Te. . . .	tegumen.
G. . . .	gnathos.	U. . . .	uncus.
J. . . .	juxta.	Ve. . . .	vesica.
L.H. . . .	left harpe.	Vi. . . .	vinculum.

Dotted and broken lines are used to outline internal and underlying structures, the shorter the strokes constituting the line the farther is that portion from the surface of the complete organ.

Alucita monospilalis, Walk. (Pterophoridae).

Tegumen moderate; uncus curved, rather narrow, hairs apically directed; aedeagus simple form, slender, doubly curved when viewed laterally, terminates with a short vesica; juxta dividing apically into two irregular lobes, bearing short stiff hairs, of which the left is considerably stouter and longer; attached firmly to right harpe; asymmetrical; harpes markedly asymmetrical, rather long, moderately broad, curved, inner surface clothed with long fine hairs towards apex, sacculus extending into a long slender free process, sinuate and dividing apically into two asymmetrical prongs; vinculum W-shaped, internal portion fitting between and external arms coming outside the harpes.

Platyptilia falcatalis, Walk. (Pterophoridae).

Tegumen short, moderately broad; uncus rather long, curved and moderately stout, hairs directed backwards; aedeagus curved when viewed laterally, basally swollen, ductus ejaculatorius entering on left side, curved ventral process near base, papillae present, more particularly on ventral surface, towards the orifice, vesica long and thickly covered with papillae, penis very short, enclosed with exception of tip in a membranous sheath; juxta apically divided into a pair of roughly triangular and pointed lobes bearing short stiff hairs; harpes long, ovate, large portion of inner surface clothed with long fine hair, short broad ventral hook near apex; vinculum with rather slender arms.

Nymphostola galactina, Feld. (Oecophoridae).

Tegumen moderate, deeply indent anteriorly, strongly curved; uncus greatly reduced, a mere rounded prominence; gnathos well developed, a stalked cape-like structure, asymmetrical, outwardly covered with short backwardly directed hairs arranged in thickly set series; aedeagus short and stout; juxta narrow, dividing into two horn-shaped lobes; harpes moderately long, fairly broad, apically truncate, sparsely clothed with hairs, sacculus extended into a small thumb-like projection situated near the middle of the ventral margin; vinculum scoop-shaped, two broad and fairly long arms.

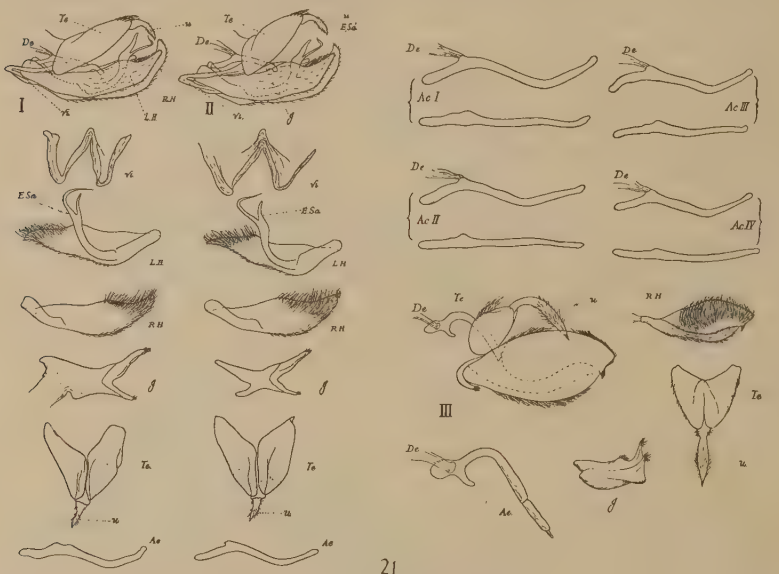

Fig. 21.—*Alucita monospilalis* and *Platyptilia falcatalis*. I—*A. monospilalis*; assembled organs, lateral aspect, and dissected parts; II—do.; assembled organs, lateral aspect, and dissected parts; the assembled organs being in a more open position than those in previous figure.

Ae. I.—do.; aedeagus, lateral aspect, and below, the dorsal aspect of the same organ (from the same specimen); *Ae.* II—do.; aedeagus, lateral aspect, and below, the dorsal aspect (from a different specimen to *Ae.* I); *Ae.* III—do.; aedeagus, lateral aspect, and below, the dorsal aspect; *Ae.* IV.—do.; aedeagus, lateral aspect, and below, the dorsal aspect (from a different specimen to *Ae.* III).

Re the above four figures—in general outlines the dorsal aspect of the aedeagus resembles the ventral aspect, in this particular species. The dorsal aspect shows whence Philpott derived his figure for *A. lycosema*.

III.—*P. falcatalis*; assembled organs, lateral aspect and dissected parts; the broken lines on harpe mark the margins of hairy area on inner surface.

Celama parvitis, Howes (Nolidae).

Tegumen considerably reduced, presenting a very narrow surface laterally; uncus reduced to a blunt prominence, bearing an apical tuft of longish hairs; aedeagus rather long, stout, considerably enlarged basally, bearing numerous series of papillae, vesica roughly conical, penis long; harpes long, apically truncate, sparsely clothed with hair towards apex, sacculus extended into a broad apically truncate process with longish backwardly directed hairs on dorsal margin, clavus a roughly thumb-like process with an irregularly toothed upper margin; vinculum scoop-shaped, roughly triangular.

Dissection of the one available example of this, at present, very rare species was a little faulty. I was unable to detect the juxta. I think the gnathos is present, in reduced form, but hesitate to state this definitely solely on the evidence afforded by the lateral view of the complete organs.

The aedeagus is a tubular structure, weakly chitinised, bearing numerous irregular vertical series of papillae on lateral and sublateral surfaces; these series extend from close to the orifice to a position near the entrance of the ductus ejaculatorius; vesica roughly conical and firmly attached to the penis, a long tubular spine-like structure, well chitinised, of which the greater portion lies within the vesica and aedeagus; on the upper surface and beginning near

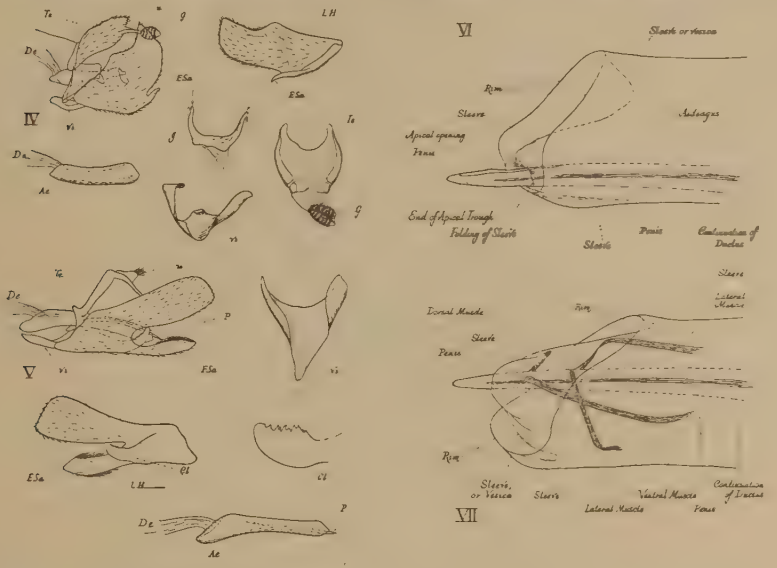

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Fig. 22.—*Nymphostola galactina* and *Celama parvitis*. IV—*N. galactina*; assembled organs, lateral aspect, and dissected parts; V—*C. parvitis*; assembled organs, lateral aspect, and dissected parts; VI—do., aedeagus, posterior portion, lateral aspect; vesica and penis presenting lateral aspects; VII—do., aedeagus, posterior portion; aedeagus presenting almost true lateral aspect but vesica and penis twisted over and viewed ventrally; unable to trace muscles beyond positions shown.

the tip of the penis is an elongate " apical opening " extending well back. The shape of this opening would seem to point to fusion of what were once two separate pieces. Attached to the penis, slightly posterior of the inner end of the apical opening, are four muscles of which two are lateral, one ventral and the other dorsal. The lateral muscles are attached farther from the apex than those of ventral and dorsal surfaces. The vesica is attached to the penis slightly forward of the ventral and dorsal muscles.

The ductus ejaculatorius enters, on the upper surface, near the anterior end of the aedeagus. Shortly before the anterior end of the penis is reached the ductus divides, the lesser upper branch entering the penis and the lower branch disappearing about half-way along the aedeagus below the penis. The ductus continues within the penis, ending rather more than half-way along the apical

opening. The lower portion of the orifice of the aedeagus extends slightly beyond the upper portion.

Owing to the impossibility of studying such an organ in use, any conceptions regarding the manner of usage must necessarily be purely theoretical and entirely dependent on the individual's interpretation of the structure. So far as this species is concerned it would seem that the aedeagus is capable of slight inflation resulting from an increase in blood-pressure, what appears to be the

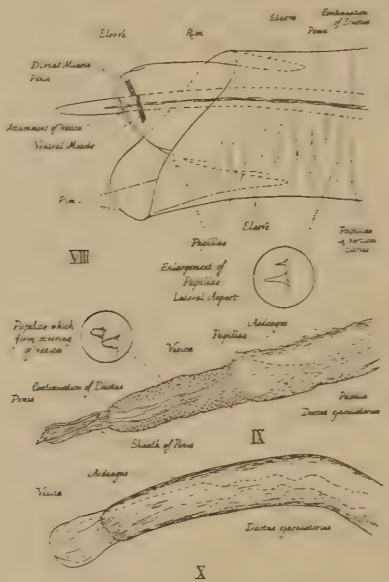

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Fig. 23.—*Celama parvitis*, *Platyptilia falcatalis* and *Alucita monospilalis*. VIII—*C. parvitis*; aedeagus, posterior portion; vesica and penis twisted still farther over than in VII; in this figure the vesica is stretched almost fully away from point of attachment to penis. Inset.—Enlargement of papillae from outer surface of aedeagus. In the above figures "sleeve" is used as a synonym for "vesica."

IX—*P. falcatalis*: aedeagus, posterior portion, lateral aspect showing vesica and penis fully extruded; chitinous penis marked with stippling. Inset.—Enlargement of papillae from surface of vesica. X—*A. monospilalis*; aedeagus, posterior portion, lateral aspect showing vesica fully extruded.

lower branch of the ductus ejaculatorius, but probably a separate vessel entering with the ductus, being the means of supply. The penis, drawing with it the vesica, is extrusible as far as the length of the vesica permits, the force being supplied by seminal pressure. Retraction of the penis is accomplished by muscular resiliency: the placement of the muscles, one leading from each major surface, lateral, ventral and dorsal, thus giving a cross formation, prevents swinging of the penis. Otherwise there would be a danger of such a chitinous structure lacerating the bursa of the female.

Normally the penis lies within the slightly protuberant lower portion of the aedeagus. It cannot be completely retracted within the aedeagus, but nearly so; this is overcome by inflating slightly the protuberant lower portion of the

aedeagus: owing to the position of the pressure-supplying vessel, this portion would naturally be that in which inflation would first become evident. The strength of the retractile muscles of the penis is sufficient to prevent the increased blood-pressure giving premature and independent extrusion of the vesica.

A hypothetical procedure in copulation would be as follows:—The aedeagus would be slightly inflated to mask the tip of the penis, the brief feeling for position being accomplished by the comparatively soft and blunt aedeagus. Slight further inflation would follow to hold the aedeagus in position: then the vesica and the hard penis are extruded well into the bursa of the female; the semen flowing through the apical opening. The posterior portion of the apical opening would have a membranous covering to prevent semen escaping behind the attachment of the vesica back into the aedeagus. The possibility of this being so is strengthened by the position of the terminus of the ductus, *i.e.* over half-way along the apical opening. The slightly protuberant lower portion of the orifice would facilitate entry into the opening of the bursa.

Copulation being completed, the seminal pressure ceases: muscular resiliency results in penis being withdrawn behind protuberant portion of aedeagus; pressure within aedeagus is lowered, slight deflation follows and aedeagus is withdrawn from the opening of the bursa; then penis reassumes normal position, protruding very slightly.

I was unable to discern any unusual features in the genitalia of the one available female.

Chaetotaxy of Larval Body.

So far as the imperfectly known New Zealand Lepidoptera are concerned, a system of classification and identification based on the chaetotaxy of the larval body is so far from infallible as to be absolutely unreliable and unsatisfactory. Working on such a system it is impossible to separate some genera, and working within certain genera impossible to separate quite valid species.

The circumstances which render chaetotaxy of little value are:—

I. Similarity between one family and another.
II. Absolute similarity between one genus and another.
III. Absolute similarity between one species and another.
IV. Variation within the species.

Below are given notes and examples of New Zealand species that fall within the above categories.

Class I. Family resemblance.

Tortricidae—Oecophoridae.

I have found that these two families overlap considerably, and it is often impossible to foretell to which family a given larva belongs.

Class II. Generic resemblance.

Family Noctuidae:—
Persectania—Leucania—Melanchra.
Family Geometridae:—
Orthoclydon—Venusia.
Family Tortricidae:—
Tortrix—Ctenopseustis.
Family Psychidae:—
Oecetieus (N.Z.)—*Thyridopteryx* (Australia).

Class III. Specific resemblance.

Family Nymphalidae:—
Pyrameis gonerilla—Pyrameis itea.

Chaetotaxy identical. Coloration also similar in these two species.

Family Noctuidae :—

Melanchra mutans—Melanchra plena.

Unable to differentiate these species on chaetotaxy; coloration frequently similar.

Leucania blenheimensis—Persectania steropastis.

Chaetotaxy identical. Some forms of *P. steropastis* are distinguishable from *L. blenheimensis* on coloration, others are not.

Persectania steropastis—Persectania composita.

Chaetotaxy identical. But may be invariably distinguished on coloration.

Persectania steropastis—Leucania semivittata.

Chaetotaxy very similar, unable to separate reliably the species on this character. Coloration, however, is a reliable guide.

Family Geometridae :—

Orthoclydon praefectata—Venusia verriculata.

Chaetotaxy identical, but coloration and host-association constitute reliable means of separation.

Family Tortricidae :—

Tortrix postvittana—Ctenopseustis obliquana.

Chaetotaxy identical. Coloration usually a reliable guide.

Ctenopseustis obliquana—Tortrix excessana.

Chaetotaxy identical; coloration very unreliable.

Family Psychidae :—

Oeceticus omnivorus (N.Z.)—*Thyridopteryx ephemeraeformis* (Austr.).

Chaetotaxy very similar.

Class IV. Specific variation.

Slight variation in the body chaetotaxy occurs in a number of species. Though slight, the variation is nevertheless often quite sufficient to prevent specimens being traced to the correct species or genus. I found such specific variation particularly noticeable in *Alucita monospilalis* (Pterophoridae) and in the introduced species *Laspeyresia pomonella* (Eucosmidae).

Additional difficulties are occasioned by families which have :—

(*a*) Two types of chaetotaxy.

(*b*) Few and very small or seemingly haphazardly arranged setae.

Examples are :—

(*a*) Pterophoridae, the contrast in types being provided by the genera *Alucita* and *Platyptilia.*

(*b*) Nymphalidae, subfamily Satyrinae, *Argyrophenga antipodum* and *Dodonidia helmsii.* Lycaenidae, *Zizina labradus.* Thyrididae, *Morova subfasciata.*

The species quoted for classes I to IV have been carefully compared from mounted skins, from photographs taken by Mr. W. C. Davies, and by superimposing tracings of one upon another. All quotations, with the possible exception of *Thyridopteryx ephemeraeformis*, are of undeniably valid species.

Entirely to eliminate the necessity of breeding, a system of larval identification must be such that an incorrect solution of species is impossible. In dealing with adults, a mistake may be more readily corrected during subsequent research than would be the case with larvae if breeding had been eliminated, and the consequences attendant on the error would probably be considerably less serious. Then, too, the system to be satisfactory would really need to be based on some character that was consistent in all instars of a particular species.

Fracker (1915), dealing chiefly with North American species, attempted

"The Classification of Lepidopterous Larvae" and devised another system of numeration of the setae. He made extensive use of the body chaetotaxy and added a rather heterogeneous collection of other characters. He is unable, in several instances, to separate families, genera and species on setal characteristics and states in other cases that his characters are inconstant.

Fracker states "New species and new instars should be described in a manner which will make like specimens recognisable in the future without repeating the breeding."

The obtaining of a system of identification which will fufil this requirement presents some very great difficulties. The system must reliably separate genera and species. It will probably have to be based on rather insignificant features, features not affected by similar environment and convergent forms. The question will have to be taken in steps, the first being to find a character of generic significance, the next to find one of specific significance. The difficulties are, of course, increased by the limits, so much narrower than in imagines, to diversity of form imposed by similar environment and number of species. It is quite likely that the character of specific value in one genus will not separate the species from those of another genus, but provided that the first step has been accomplished previously, this will not affect the issue.

Although chaetotaxy is so unreliable, setal maps are of value in so far as they give a better idea of the setal arrangement than it is possible to obtain from an ordinary figure of the complete larva. Fracker studied the homology and homotypy of the setae, plotted a hypothetical segment, and devised a new system for numbering the setae on a map, a system he seemed to have no difficulty in applying to his various figures. But a difficulty arises the moment one attempts to apply any numeration system to an undescribed larva lacking what Fracker considers the full complement of setae. Has a particular seta been lost or transposed? It is a question that is often absolutely unanswerable. What marks the boundary between loss and transposition? This is also often quite unanswerable. Can there be a scheme of numeration of the setae which can be universally applied with any certainty? And is there any great advantage in having the setae numbered when chaetotaxy is so unreliable for purposes of classification and identification?

I am unable, in some cases, to reconcile Fracker's system with his own figures in regard to the naming of certain setae. Copies of some of the figures in question are appended.

The next four figures (24 to 27) are copied from some of Fracker's diagrams.

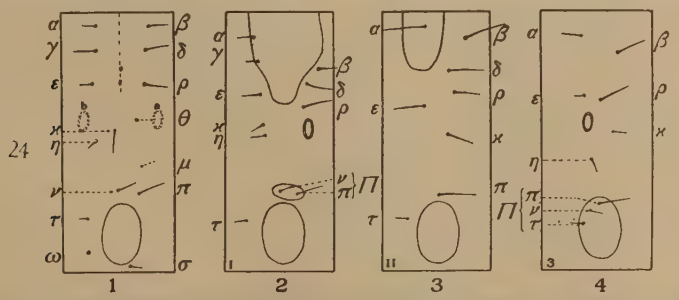

FIG. 24.—1. "Hypothetical type showing the twelve primary setae. In addition three of the more usual subprimaries are dotted in." 2, 3, 4. "*Hepialus mustelinus*, HEPIALIDAE, Jugatae. Prothorax, mesothorax, and third abdominal segment, first instar."
In 4 why should not ρ be δ?; ρ being lost.

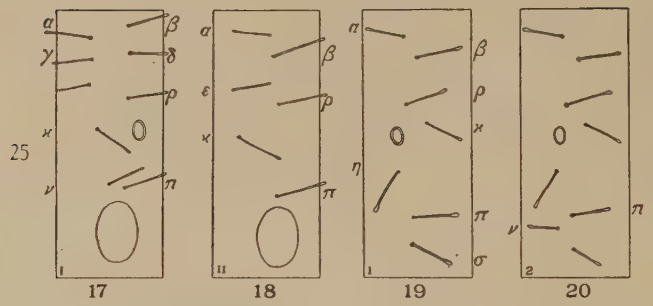

Fig. 25.—17, 18, 19, 20. "*Feltia gladiaria*, Noctuidae. Prothorax, mesothorax, and first and second abdominal segments respectively; first instar."

In 18 why should not β be δ?, β being lost; and in 19 why should not β be δ; ρ be ε; ϰ be ρ; and η be ϰ?

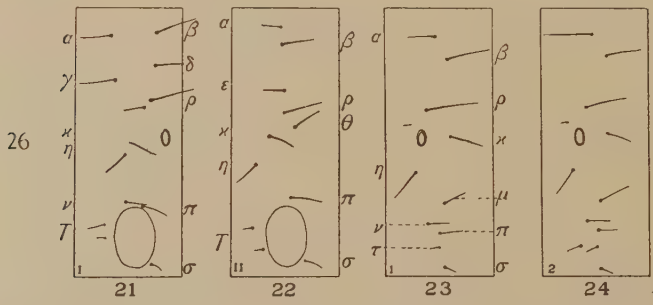

Fig. 26.—21, 22, 23, 24. "*Feltia gladiaria*, Noctuidae. Same segments of the mature larva."

In 21 why should not γ be ε; in 22 why should not β be δ—β being lost; and in 23 why should not β be δ, β being lost; ϰ be θ; and the small seta above spiracle be ϰ?

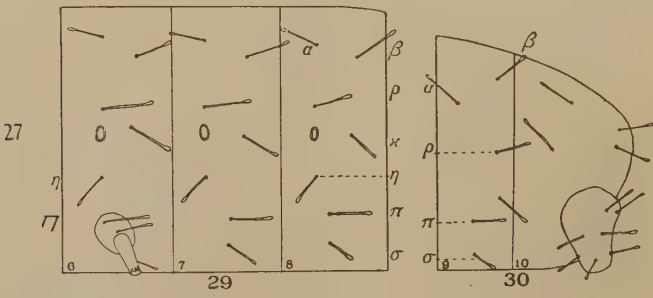

Fig. 27.—29, 30. "*Feltia gladiaria*, Noctuidae. Abdominal segments 6 to 10 respectively; first instar."

In 29 why should not β be δ, ρ be ε; and in 30 why should not α be ε and ρ be ϰ?

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I am indebted to Dr. D. Miller, of the Cawthron Institute, for advice regarding this paper. I wish to thank Mr. W. C. Davies, also of the Cawthron Institute, for photographs of the figures from Fracker's work.

In dealing with the larva the head has been regarded as segment 1, the thoracic and abdominal segments following on as 2, 3, 4, 5, 6, etc. All the larval figures deal solely with the final instars.

STUDIES ON HAWAIIAN SCOLYTIDAE (COL.)

By Dr. Karl E. Schedl.

Through the courtesy of Mr. F. C. Hadden at Honolulu I have been able to examine numerous specimens of Scolytidae from the Hawaiian Islands. I have compared most species of the genus *Xyleborus*, Eichh., with the types which were kindly lent to me by the British Museum (Natural History). It was more difficult to study those belonging to the genus *Hypothenemus*, Westw., and I have been able to get for comparison but a single species, *H. maculicollis*, Sharp. Three species represented in the collection are apparently identical with Perkins' *H. insularis*, *H. sylvicola* and *H. ruficeps*, but his descriptions are too brief to be of much value in determining species of so difficult a genus. Rather than describe them as new, I prefer to adopt Perkins' names and to give a full description that will enable other students to make determinations.

Xyleborus kauaiensis, Perk.

♂ (nov.). Reddish-brown, base and sides of the *elytra* yellowish, 3·88 mm. long, 2·85 times as long as wide.

Front shining, separated from the vertex by an acute bisinuate ridge, from the epistomal margin up to the vertex with a deep longitudinal impression, very sparingly and finely punctured. *Pronotum* 1·20 times as long as wide (including the process), with a truncate, shallowly emarginate process in front, remaining portion quadrate when viewed from above, subshining and sparingly punctured behind, the anterior steep concave face densely coarsely punctured with reddish inclined hairs, median line impunctate. *Elytra* feebly narrower and 1·35 times as long as the pronotum, sides parallel, rounded behind, striate punctate, striae moderately impressed on the disc, not at all impressed at the sides, strial punctures somewhat irregular, densely placed; interspaces shining, irregularly uniseriately punctured; declivity opaque, convex, commencing at the last third, feebly flattened at the sides of the suture, punctuation more weakly developed, confused in parts, first interstices feebly widened and with three minute setose tubercles on each side.

Type in the possession of Mr. F. C. Hadden, *paratypes* in my collection.
Locality: Hawaii: Upper Hamakua, Ditch Trail (*F. C. Hadden*).

Xyleborus ignobilis, Perk.

Although I have not seen the type and the description is very brief, I suspect that this species may prove to be identical with *Xyleborus fornicatus*,

Eichh. (*X. fornicatior*, Egg.). In the long series before me the brown form *X. fornicatior* and the nearly black form *X. fornicatus* are represented in about equal numbers.

Xyleborus spinosulus, sp. n.

♀. Dark brown, 2·42 mm. long, 2·50 times as long as wide. No allied form has been described from the Hawaiian Island. At present I place it between the group of *X. fallax* and the extremely strongly armed *X. mirabilis*, Egg., *X. torpedo*, Egg., and *X. bicuspis*, Egg.

Front convex, opaque, with shining, slightly raised median line, deeply punctured, punctures more closely placed in front. *Pronotum* hardly longer than wide, globose, sides slightly arcuate, widest at the middle, feebly constricted and rather narrowly rounded in front; anterior margin finely crenulate, summit at the middle, anterior area steep, finely rather densely asperate, posterior area shining, sparsely punctured. *Elytra* as wide and 1·40 times as long as the pronotum, widest at the base, sides parallel on the basal third, then gradually narrowed and narrowly rounded behind; basal half shining, cylindrical striate-punctate, striae not impressed, strial punctures rather remotely placed, interspaces flat, with a row of fine somewhat irregularly placed punctures; declivity commencing at the middle, oblique, flattened, the suture but slightly elevated, flattened face irregularly punctured, at the summit with a small setose granule on the first interstices, a small tooth on the apex of the same interstices, two pairs of large conical teeth on the sides of the flattened area, one pair at the middle of the declivity, another one at the apex, both in the prolongation of the third interstice, the rounded side margins bear a row of closely placed tubercles between the two large teeth. The first striae is somewhat indicated on the flattened face.

♂. Dark brown, 1·84 mm. long, 2·00 times as long as wide.

Front convex, opaque, densely punctured, with a shining median line. *Pronotum* longer than wide (8 : 7·2), sides subparallel, very slightly arcuate, broadly rounded in front; feebly convex, without asperities, punctured throughout, punctures smaller and more crowded in front, sparingly placed and coarser behind. *Elytra* as wide and 1·45 times as long as the pronotum, strongly convex from the base to the apex, gradually narrowed and narrowly rounded behind, moderately densely and coarsely punctured throughout, with indications of strial rows, which are more pronounced on the declivity convexity; with short, pale, erect pubescence.

Type in the collection of Mr. F. C. Hadden, *paratypes* in my own.

Locality: Hawaii: Honolulu, 1700 feet, Koa and Tantalus, Oahu (*F. C. Hadden*).

Hypothenemus insularis, Perk.

Dark brown to black, from 1·00 to 1·4 mm. long, rather variable in size, 2·50 times as long as wide.

Front convex, densely roughly punctured, with a shining low tubercle in the centre. *Pronotum* wider than long (13·0 : 11·5), widest at the base, sides somewhat convergent towards the ontero-lateral angles, broadly rounded in front; summit at the middle, with a transverse shallow depression behind; anterior margin armed with 6 to 8 low asperities, anterior area very steep, opaque, with rather low and remotely placed asperities which are hardly arranged in concentric rows, posterior area densely, rather roughly punctured, the narrow interspaces shining. *Elytra* as wide, to hardly noticeably wider and 2·00 times as long as the pronotum, sides parallel, rounded behind, striate-punctate, striae feebly impressed, strial punctures rather coarse and very closely placed, interspaces narrow, rugosely punctured, declivity convex, from the interspaces arise short, pale, yellowish, scale-like, erect hairs, the strial punctures bear much shorter hair-like setae.

Numerous specimens before me vary in size and colour, but I have failed to find any sexual differences.

Localities: Hawaii: Honolulu, *ex* monkey-rod; S. Saman, Wailua, Kaimuki; some of them have been taken from *Spondias* sp. (*F. C. Hadden*).

Hypothenemus sylvicola, Perk.

Yellowish-brown to dark brown, 1·30–1·60 mm. long, a distinctly more oval species than *H. insularis*, Perk., and *H. ruficeps*, Perk., 2·10 times as long as wide.

Front convex, opaque, finely punctulate, with a narrow shining median line which is strongly widened on the vertex. *Pronotum* globose, wider than long (19·2 : 18), widest at the base, rounded from the base to the apex in a broad curve, the anterior margin medially but little extended and with six asperities of nearly equal size; summit behind the middle, transversity depressed behind, anterior area with rather low and numerous asperities which are partly arranged in broken concentric rows, posterior area short, reticulate, with scattered punctures. *Elytra* wider (21 : 19·2) and 1·44 times as long as the pronotum, gradually narrowed and rather broadly rounded behind, widest shortly before the middle, declivity uniformly convex; surface subshining, finely reticulate, in rows shallowly punctured, interspaces with a row of finer punctures from which arise short scale-like yellowish setae, the setae of the strial punctures hair-like, very short and inconspicuous.

The long series show variations in colour from pale yellowish-brown to a rather dark brown, but they never become as dark as *H. insularis*, Perk., and *H. ruficeps*, Perk.

Localities: Hawaii: Honolulu, Hanoa Valley, *ex* monkey-rod (*F. C. Hadden*).

AN ARABIAN SPECIES OF EUMASTACIDAE (ORTH., ACRID.)

By Prof. C. Bolivar y Pieltain.
(*Madrid.*)

The discovery of a species of Eumastacidae in the Arabian fauna is a remarkable fact, more especially since the new insect, collected at Daka on the Red Sea coast, belongs to the well-known genus *Thericles*, typical of Equatorial and Tropical South Africa, where it is widely distributed (fig. 3).

Fig. 1.—*Thericles arabicus*, sp. n., lateral view of ♀ type; × 4½.
Fig. 2.—Subgenital plate of *Thericles arabicus*, sp. n., ♀; × 10.

This discovery would be even more astonishing if we had not been prepared by previous and similarly interesting records of typical Ethiopian grasshoppers and other insects in Arabia.

In a recent paper B. P. Uvarov * gives some particulars on the composition

* Uvarov, B. P., 1932, Orthoptera collected by Mr. Bertram Thomas in Southern Arabia, *Proc. Zool. Soc. Lond.*, 1932, (2) : 259–260.

of the Arabian fauna derived from the study of the Orthoptera. This fauna seems to consist mainly of Eremian forms, with some Ethiopian and Oriental elements, both subtropical and tropical, while some species are to be found that clearly belong to the ancient fauna of Mediterranean countries. As that author points out, it is not possible as yet to draw definite zoogeographical conclusions, since we are still far from knowing the whole fauna of the country.

The existence in Arabia of *Thericles*, which are small and apterous grasshoppers probably adapted to very local conditions of life, will prove to be of still more interest than that of genera such as *Cataloipus* well provided with organs of flight. In my opinion *Thericles arabicus* ought to be considered a very ancient relic.

Fig. 3.—Distribution of the genus *Thericles* in Africa and in Arabia.

I desire to express my best thanks to the British Museum (Natural History) and particularly to Mr. B. P. Uvarov, for sending this insect for me to study.

Thericles arabicus, sp. n. (figs. 1 and 2).

Type.—♀. General colour greenish-yellow, without markings or spots of other colour. Dorsal and lateral sides of the head green; face yellowish-green. Eyes pale chestnut. The first three joints of the antennae green, the remainder greyish; the apical ones darkened, especially on the dorsal side. Thorax and fore-legs green. Hind femora green, with the externo-median areas darkened, and the genicular arcs chestnut. Hind tibiae rose-coloured and only green at the condylar portion; with black spines. Hind tarsi rose at the upper-side, green in the rest. Abdomen yellowish-green. Vertex with obtuse median and lateral

carinae, rugulose. Margins of frontal median carina obtuse-angulated over the eyes, rather flattened and joined together for a short space above the lateral ocelli. Sides of the front rather excavated. Antennae very short. Eyes distinctly longer than the infraocular portion of the genae. Lateral lobes of pronotum twice as high as long; front margin truncated, hind one distinctly emarginated; dorsal carina slightly incurved, the front and hind angles acutely marked. Front and middle femora with both dorsal carinae ending in a minute black spine. Front tibiae with four apical spines at the front margin and two at the hind one. Middle tibiae with two apical spines at the anterior margin and three at the posterior one. Hind femora short and thick; the dorsal median carina is the only one bearing spines. Hind tibiae with 15 spines on the outer border and 15–16 on the inner one. Abdomen much compressed. Supra-anal plate lanceolated, with two strong carinae. Cerci very short. Subgenital plate compressed, with a median carina in the second half; the posterior border truncate, and bearing at each side of the centre (fig. 2) a horny, acute, and brown-coloured process.

Length of body, 16·5; pron., 1·8; height of pron., 3·8; length hind fem., 7·8; hind tib., 8·1 mm.

Arabia: Daka, S. Hedjaz, 1 ♀ (type 1931–549), 17.x.1931 (*H. St. J. B. Philby*).

The description of this *Thericles*, based only on the female sex, remains unfortunately very incomplete as many of the more important characters of specific value are derived from the male. For that reason it is not easy to point out the exact relationship of this species with the African ones, as females of several species are very like others. Notwithstanding, we can see that it belongs to the group of *Thericles* which have spines only on the median dorsal carina of hind femora; to this group belong *T. puberulus*, Stål, *kongoni*, Sjöst., *disparilis*, C. Bol., *euchore*, C. Bol., *obtusifrons*, Stål, *carinifrons*, Karsch, *tvigga*, Sjöst., and other species. The new one presenting an excised hind margin of the pronotum appears to be more closely related to the five first-named species; since the pronotum is truncate in the last two.

It seems to be easily differentiated from the other species by the subgenital plate bearing two horny processes at the hind margin.

ZUR KENNTNIS DER RAUPENFLIEGENFAUNA DER SALOMON-INSELN (DIPT., TACHINIDAE)

Von N. Baranov

(*Entomologe des Institutes für Hygiene in Zagreb, Jugoslavien.*)

Von dem Imperial Institut of Entomology in London erhielt ich zwecks Bestimmung eine kleine Raupenfliegensammlung (Tachinidae = Larvaevoridae) von den British Solomon Islands. Nachdem über die Dipteren der Pazifischen Inseln in den letzten Jahren so manche bedeutende entomogeographische Arbeit geschrieben wurde, halte ich es für angebracht, die Resultate der Bearbeitung vorliegender kleinen Sammlung zu veröffentlichen.

Die Fliegen waren alle in bestem Zustand und gut präpariert, so dass die Bestimmung bereits bekannter Arten, d.h. solcher mit einer guten, brauchbaren Diagnose, nicht allzu schwer war. Die Arten, welche ich hier als neu beschrieben habe, sowie *Chrysosarcophaga superba*, Towns., sind sehr wahrscheinlich Endemiten. Eine Sarcophaginen-Art—*Phalacrodiscus* sp. ?—ist leider nach dem einzigen weiblichen Exemplar nicht näher zu bestimmen gewesen. Die übrigen Arten sind weit verbreitet und gut bekannt, bloss *Microceromasia sphenophori*, Villen., scheint sich nur auf die Melanesische Subregion zu begrenzen.

Die Arten.

Cuphocera sumatrensis, Towns. 2 ♀♀.

Grosse, robuste Exemplare mit dunklen Flügeln und schwarzem, gebändertem Abdomen und nur dessen 5. Tergit dunkelrot durchscheinend. Guadalcanal, 10–11.vii.1933 (*R. J. A. W. Lever*).

Sturmia (*Ugomyia*) *sericariae*, Corn. 1 ♀.

Faisi, Shortlands (*H. W. Simmonds*).

Sturmia inconspicuoides, Bar. 2 ♀♀.

Utupua, vi.1933 (*R. J. A. W. Lever*). Fativa, Ysabel I., iii.1932.

Microceromasia sphenophori, Villen. 2 ♂♂.

Lingatu, Russell I., vii.1933 (*R. J. A. W. Lever*).

Eurystaea leveriana, sp. n. 1 ♀.

In der Grösse und Erscheinung an die europäische *Eurystaea scutellaris*, R.D. = *Discochaeta hyponomeutae*, Rond., erinnernd.—Kopf im Profil hoch und schmal. Facialprofil sehr lang. Stirn am Scheitel kaum schmäler als ein Auge. Ozellarborsten vorhanden. 2 reklinate, 2 herabsteigende und 2 sehr feine gekreuzte Frontalborsten. Facialien bis zur Hälfte fein beborstet. Vibrissen im Niveau des Kopfunterrandes. Fühler schmal und lang. Fühlerborste länger als das 3. Fühlerglied, mit deutlich verlängertem 3. Glied. Basalhälfte der Fühler, Fühlerborste und Taster gelblich. Bereifung des Kopfes silbrig. Schmale Stirnstrieme braun. Thorax mit weisslichem Reif, welcher vor der Naht dichter ist und vier schwarze Längsstriemen sehen lässt. 4 Dorsozentralborsten. 3 Sternopleuralborsten. Schildchen an der Spitze rot; beiderseits mit 2 Laterlaborsten; Apikalborsten fein, halb aufgerichtet, konvergierend. Abdomen glänzend schwarz, mit schmalen weissen Basalbinden. 2. Tergit ohne mittlere Randborsten, 3. mit 2 anliegenden. Diskalborsten fehlend. Flügel breit, etwas gelblich. Zelle R breit; 3. Längsader an der Flügelspitze mündend, mit 3 Borsten an der Basis; Beugung der Medialader abgerundet, Spitzenquerader stark gebogen; 1. Hinterrandzelle schmal offen. Schüppchen weisslich. Beine schwarz. Körperlänge 5½ mm.

Su'u, Malaita, iv.1933 (*R. J. A. W. Lever*).

Doleschalla solomonensis, sp. n. 4 ♂♂.

Bereifung des Kopfes deutlich gelblich. Fühler mehr oder weniger rötlich. Taster bräunlich, an der Spitze heller. Thorax dicht und gelblichgrau bestäubt, mit 4 schwarzen Längsstriemen vor der Naht, von denen die mittleren ganz schmal, die äusseren viel breiter sind; hinter der Naht fliessen alle Striemen zusammen und bilden einen schwarzen Fleck, der hinten ausgezackt ist und ungefähr die vordere Hälfte des Postscutums einnimmt. Schildchen schwarz, nur an der Spitze gelblichgrau bestäubt. Thoraxseiten stellenweise dicht gelblichgrau bestäubt, dazwischen mit schwarzen Streifen und Flecken; betrachtet man die Fliege von der Seite und hält sie dabei etwas schräg, so dass der Kopf nach oben, das Abdomen nach unten gerichtet ist, dann erscheint die gelbe Zeichnung der Pleuralgegend in Form eines deutlichen "Z." Von Akrostichalborsten sind nur 1 schwach entwickeltes Paar vor dem Schildchen vorhanden; von Dorsozentralborsten: 1 vor und 2 hinter der Naht; von Intraalarborsten: nur 1 präsuturale; 2 Supraalare; 2 Humerale; 2 Sternopleurale; keine Hypopleuralborsten. Schildchen nur mit Basal- und Angularborsten. Abdomen gelblich durchscheinend, die Tergite 3–5 mit schmalen, schwarzen

Apikalbinden, ganz feinen weissen Basalbinden und auf dem Dorsum mit angedeuteter Längsmittellinie. Letztes Tergit schwärzlich mit blauem oder grünem Metallschimmer, nur die Mitte des Dorsums hell. Flügel am Vorderrande dunkelbraun, der übrige Teil deutlich gebräunt, besonders längs der Adern; 1. Hinterrandzelle schmal offen und fast an der Flügelspitze mündend; Beugung der Medialader nahe am Flügelrand, rechtwinklig, mit Aderanhang. Beine lang, schwarz, mit hellbraunen Schenkeln und ebensolchem, durchscheinendem Ring in der Mitte der Schienen (oder etwas distal). Klauen mässig lang. Körperlänge 13–14 mm., Flügellänge 11–12 mm.

Von *Doleschalla makilingensis*, Towns., welcher sie am nächsten steht, unterscheidet sie sich ausser durch die koloristischen Merkmale noch durch die schmälere Stirn, den Aderanhang der Medialader und die völlige Abwesenheit der schwarzen Beborstung auf den Hypoleuren.

Typus: Lunga, Guadalcanal (*R. J. A. W. Lever*).—Die übrigen Exemplare: Tulagi, 23. und 30.vii.1933 (*R. J. A. W. Lever*).

Thyrsocnema kohla, John. et Hardy 1 ♂.

Savo Island (*R. J. A. W. Lever*).

Thyrsocnema orchidea, Boettch. 3 ♀♀.

Utupua, v. und 3.vi.1933 (*R. J. A. W. Lever*): Tulagi (*R. J. A. W. Lever*).

Thyrsocnema misera, Walk. 1 ♂.

Tulagi, ii.1933 (*R. J. A. W. Lever*).

Athyrsia atypica, sp. n. 2 ♂♂.

Schildchen ohne Lateralborsten, jedoch die Angularborsten weiter als gewöhnlich von einander entfernt, und zwischen ihnen am Schildchenrande die beiden langen, divergierenden Diskalborsten, welche fast an der normalen Insertionsstelle der Angularborsten stehen. Apikalborsten fehlen. 3. Tergit mit 2 Randmakrochäten. 1. Genitalsegment ohne Borstenquerreihe. Hinterschienen ohne Pelzbehaarung. Mittelschienen innen hinten vor der Spitze ohne Ctenidium oder Borstenreihe.—Stirn am Scheitel (im Niveau des Ozellendreieckes) halb so breit wie ein Auge. Äussere Vertikalborsten fein aber deutlich. 3. Fühlerglied 2–2½ mal so lang wie das zweite. Taster schwarz. Bereifung des Kopfes gelblich. Thorax mit 3–4 feinen präsuturalen und 1 präscutellaren Akrostichalborste. 4 Dorsozentralborsten hinter der Naht. Flügel mit nackter 1. Längsader. 1. Genitalsegment dicht, grau bestäubt, 2. glänzend schwarz. Körperlänge 7 mm.

Typus: Fativa, Isabel I., iii.1932 (*R. J. A. W. Lever*).—Tulagi, 5.viii.1933 (*R. J. A. W. Lever*).

Phalacrodiscus sp.? 1 ♀.

Ein Weibchen mit messingfarbener Bereifung des Kopfes und ebensolcher Hinterkopfbehaarung; Thorax dicht, messinggelb bestäubt, mit scharf ausgeprägten schwarzen Längsstriemen, deren mittlere bis auf das Schildchen reicht; dieses mit kurzen aber deutlichen Lateralborsten und 2 aufgerichteten Borsten, welche ungefähr dort stehen, wo sich sonst die Apikalborsten befinden würden. Ich halte diese Borsten für die an den Hinterrand des Schildchens gerückten Diskalborsten, was mich veranlasst, diese Fliege für einen Vertreter der Gattung *Phalacrodiscus*, Enderl., zu halten.—Flügel längs der Adern deutlich gebräunt. Abdomen mit ziemlich deutlicher Längsmittellinie, im Übrigen mit schwach ausgeprägter *Sarcophaga*-ähnlichen Bereifung. Fühler dunkelbraun. Körperlänge 10½ mm.

Tulagi, vii.1933 (*R. J. A. W. Lever*).

Ohne Kenntnis des dazugehörigen Männchens kann ich mich nicht entschliessen diese Fliege zu benennen.

Lioproctia paineiana, sp. n. 1 ♂, 4 ♀♀.

♂. Stirnbreite am Scheitel beträgt ⅔ der Augenbreite. 3. Fühlerglied 2½ mal so lang wie das 2., braun. Taster schmal und schwarz. Bereifung des Kopfes sowie die des Hinterkopfes messinggelb. Thorax messinggelb bereift, Abdomen mehr weisslich. 5 Dorsozentralborsten hinter der Naht. Nur 1 Paar Akrostichalborsten vor dem Schildchen.

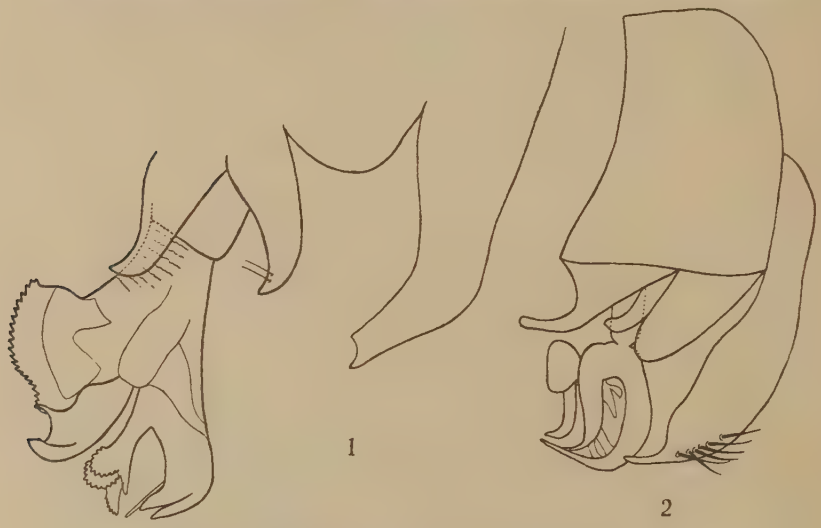


Fig. 1.—Hypopygium von *Athyrsia atypica*, sp. n. ♂.
Fig. 2.—Hypopygium von *Lioproctia paineiana*, sp. n. ♂.

3. Abdominaltergit ohne Randmakrochäten. Flügel kaum gebräunt; Schüppchen graugelb, der Rand mehr ockergelb. Mittelschenkel ohne Ctenidium, jedoch mit einer Borstenreihe. Hinterschienen dicht aber nicht besonders lang behaart. Körperlänge 11½ mm.

♀. Gleicht bis auf die gewöhnlichen Geschlechtsunterschiede dem Männchen, nur ist die Bereifung des Kopfes und die Thorakalbestäubung bei einigen Exemplare etwas blässer.

Typus ♂: Tenaru, Guadalcanal, 24.viii.1928 (*R. W. Paine*).—Paratypen ♀♀: Tulagi, ii.1933; Su'u, Malaita, iv.1933; Lunga, Guadalcanal, 9.viii.1933 (*R. J. A. W. Lever*).

Chrysosarcophaga superba, Towns. ? ♀.

Diese von Miss D. Aubertin als *C. superba*, Towns., mit einem Fragezeichen determinierte Fliege, stimmt mit der Townsend'schen Diagnose nicht völlig überein. Sie muss dem noch unbekannten Weibchen von *Phalacrodiscus dahlianus*, Enderl., sehr ähnlich sein, welche Art vom Bismarck-Archipel beschrieben wurde.

Guadalcanal, 10.vii.1933 (*R. J. A. W. Lever*).

FOUR NEW DIPTERA IN THE COLLECTION OF THE BERLIN ZOOLOGICAL MUSEUM

By F. W. Edwards, M.A., Sc.D., F.R.E.S.

(*British Museum, Natural History.*)

During a visit to Berlin in August 1933 I noted the presence in the collections of the Zoological Museum of specimens of undescribed species of several archaic genera of Diptera. Four of these are described below by kind permission of Dr. Günther Enderlein.

Anisopodidae.

Olbiogaster zonatus, sp. n.

Closely allied to *O. orientalis*, Edw., differing chiefly in markings of mesonotum and abdomen.

♂. Length, 11–12·5 mm.; wing, 7·5–8 mm.; antenna, 7·5–8 mm.

Head mainly shining ochreous; face indistinctly darker in middle (not black as in *O. orientalis*); a blackish spot over ocelli; upper part of occiput with dark suffusion. Palpi yellow. Antenna with scape clear yellowish, flagellum black. *Thorax* mainly orange-yellow; mesonotum with six more or less confluent black marks, consisting of a short pair of longitudinal stripes in middle of front margin, a transversely oval mark behind each shoulder, and a broad longitudinal stripe on each side behind this, not quite reaching back to scutellum, which is yellow; postnotum yellowish-brown, black at tip only (not wholly black as in *O. orientalis*); pleurae mainly shining black, leaving a yellow area around anterior spiracle and another (larger) in middle below wing-root. *Abdomen* orange; tergite 1 with lateral and posterior borders broadly black, 2–4 broadly black on posterior margin only, the black area somewhat produced forwards in middle, but not nearly reaching base; 5 with posterior margin rather more narrowly black; 6 and 7 wholly black; sternite 1 wholly orange, 2–5 each with a narrow black band close to posterior margin, 6 and 7 wholly black; hypopygium almost white. *Legs* orange, including all coxae; hind femur narrowly but rather distinctly blackish at tip; hind tibiae and all tarsi darkened. *Wings* almost as in *O. orientalis*; dark streak across *r-m* only faintly discernible; wing-tip only faintly darkened. Halteres with yellow stem and black knob.

Formosa: Toyenmongai, near Tainan, v.1910 (*Rolle*). Type ♂ in Berlin Museum; paratype ♂ (with venter discoloured) in British Museum.

Both *O. orientalis*, Edw., and its supposed variety (more probably a distinct species) *fulviventris*, Edw., have been found only in Ceylon and are known only from single females. It is just possible that *O. zonatus* may prove to be the male of one of these, but both the Ceylon forms mentioned differ in various details of coloration, *O. orientalis* being much darker and *O. fulviventris* having the venter and halteres yellow—differences which one would not expect to be merely sexual.

Blepharoceridae.

Edwardsina (s.str.) **dentulosa,** sp. n.

Differs from other known Chilean species in form of antennae, the flagellar segments being conspicuously rounded beneath.

♂. Length about 4·5 mm.; wing, 8 mm.

Head dark greyish above, light ochreous-grey on face. Proboscis scarcely equal to vertical height of head. Palpi brownish, longer than proboscis by length of last two segments; second segment rather shorter than first, but subequal to fourth, scarcely more than three times as long as broad and not swollen at tip; third well over half as long as second or fourth. Antennae somewhat longer than head and thorax together, scape brownish, flagellum black; all flagellar segments except the last few appearing much flattened (partly, no doubt, owing to shrinkage), as deep as long or somewhat deeper, strongly rounded beneath, last few segments more slender, terminal segment longer. *Thorax* dark greyish, with three faintly indicated stripes on mesonotum, separated by narrow grey lines, most visible from in front; pleurae dark, except for an ochreous area between hind coxae and base of halteres. *Abdomen* dark greyish above and below, lateral membrane yellowish. Hypopygium much as in the other species. *Legs* light brownish, tips of femora not obviously darkened; all coxae light ochreous. Fifth tarsal segment of all legs with the usual group of black spines at base beneath. Claws with four or five almost equally strong and evenly spaced black teeth, besides a few very small teeth at base; last tooth far beyond middle of claw. *Wings* clear, without stigma; venation almost as in *E. stigmatica*. Halteres with dark knob.

Chile: Cauquénes, 18.ix.97, 1 ♂, and 15.xi.99, 1 ♂, Rancagua, 7.x.01, 1 ♂ (*S. Schönemann*). Cotypes in Berlin and British Museums.

This new species is perhaps more like *E. dispar*, Edw., than any of the other described Chilean species, both being of about the same size and having the same colouring of the legs. The antennae of the ♂ *E. dispar* are much longer and the claws differently toothed. *E. chilensis*, Alex., *E. fuscipes*, Edw., *E. chilota*, Edw., and *E. stigmatica*, Edw., are all considerably larger than the new species, besides differing in antennae and claws.

Scatopsidae.

Canthyloscelis apicata, sp. n.

Distinguished from the other two Chilean species by the brown thorax and dark wing-tip.

♂. Length, 3·5–4 mm.; wing, 5 mm.

Head ochreous-brown, with black ocellar spot. Palpi light brownish. Antennae with scape ochreous-brown, flagellum black; flagellar segments simple, without pectinations, articulated slightly above middle, all except last few slightly deeper than long and slightly produced beneath at tip. Ocelli distinctly removed from eyes, lateral ocelli not twice as large as median. *Thorax* rather light brownish, slightly darker on pleurae. Sternopleura and middle of postnotum shining. *Abdomen* dull blackish; hypopygium brown. *Legs* mainly pale yellowish; middle tibia indistinctly darkened on basal half; hind femur with the usual broad dark brown ring beyond middle and dark tip; hind tibia largely dark. *Wings* with macrotrichia practically confined to distal fourth; a broad brown band extending from thickened portion of R_5 to hind margin, and including most of wing-tip, though leaving a more or less obvious small clearer area immediately below terminal section of costa; distal half of costal cell only faintly darkened; no trace of darkening on hind margin of wing except at tip. Halteres yellow. Venation almost as in *C. pectinata*.

Chile: Comudes, 16–17.ii.1902 (*Schönemann*). Cotypes, 3 ♂♂ in Berlin Museum, 1 ♂ in British Museum.

This new species is closely allied to *C. pictipennis*, Edw., differing in its smaller size, much lighter thorax, and absence of definite markings on wings except for the dark tip.

C. pictipennis was described from the ♀ only, but since the description was written I have seen a ♂ specimen (lent from the Washington Museum), taken by Mr. R. C. Shannon at Casa Pangue, Llanquihué Prov., xii.1926. This has simple, non-pectinate antennae like those of *C. apicata*.

It should be noted that in the figure of *C. pectinata* (Diptera of Patagonia, Brit. Mus. **2** : 91), the lower branch of the median fork is incorrectly shown as complete at the base.

Rhagionidae.

Dasyomma herbsti, sp. n.

A black species with yellow sides to abdomen, allied to *D. atribasis*, Mall., and *D. vittatum*, Mall.

♀. Length about 6 mm.

Head black, frons and swollen central portion of face brightly shining, lateral areas of face with whitish dust. Antennae all black, structure as in other species of the genus. Occiput moderately shining, with black hair. *Thorax* black, moderately shining; shoulders more brownish; mesonotal hair mostly black; but in two specimens rather light brownish towards front, especially on shoulders (evidently variable). *Abdomen* scarcely broader than thorax, rather longer and narrower than in some species, surface shining; first visible tergite extensively darkened in middle towards posterior margin, but yellow at sides; second and third tergites black on middle third, yellow at sides; fourth tergite black, in one specimen yellow laterally at base, remainder wholly black. Pubescence mainly black, more or less extensively yellowish on the yellow parts. *Legs* wholly blackish. *Wings* smoky, with darker stigma and ill-defined darker shades across ends of basal and discal cells; the usual clear area in middle of upper basal cell; discal cell (except at its base and tip) slightly clearer than remainder of wing. Halteres blackish. Short setulae present (as in *D. vittatum*) on R_1, R_{4+5}, base of R_5, and *Cu*.

Chile: Concepcion, 1903 (*P. Herbst*). Cotypes, 2 ♀♀ in Berlin Museum, 1 ♀ in British Museum.

Of the two nearly allied species so far described, *D. atribasis*, Mall., differs in having the face somewhat dull, first abdominal tergite wholly black, and wings without trace of darker shade over outer end of discal cell; *D. vittatum* has the first abdominal tergite almost wholly yellow, and the yellow on the succeeding tergites more extensive, also the wings more variegated in appearance, with a lighter area on the costa beyond the stigma.

NEW SPECIES OF NORTH AMERICAN *APHODIUS* (COL., SCARABAEIDAE)

By Howard E. Hinton

(*Berkeley, California.*)

This paper is the result of the study of the beetles of the subfamily Aphodiinae from Mexico and Central America found in the collection of the United States National Museum and that of the writer. The writer is indebted to Dr. E. C. Chapin of the above institution for the loan of material.

Aphodius nubilus, sp. n.

Moderately short, subparallel, convex, shining; head, scutellum and sutural interval black, pronotum black with the lateral margins rufo-piceous, elytra rufo-testaceous at base, darker apically, mouth-parts and tarsi testaceous, legs rufo-piceous. *Head* two-thirds as wide as pronotum, moderately convex, trituberculate, sparsely, finely punctate at base, more coarsely and densely punctate anteriorly; clypeus broadly, very feebly emarginate and obtusely rounded on each side of the emargination, sides feebly arcuate, extremely slightly sinuate before genae; genae broadly rounded, not prominent. *Pronotum* three-fourths as long as wide; sides arcuate; base arcuate, feebly bisinuate, marginal line entire; hind angles obtuse, broadly rounded; disk finely, sparsely punctate, sides with a few coarse, sparse punctures intermixed with the finer punctures. *Elytra* at base as wide as prothorax, scarcely wider posteriorly; disk finely striate, striae rather finely and closely punctate; intervals nearly flat, extremely finely and sparsely punctate; scutellum impunctate. *Mesosternum* subopaque, alutaceous, coarsely, densely punctate anteriorly and at sides, not carinate; mesosternum with a finely impressed, longitudinal line, sparsely and finely punctate; abdomen finely, sparsely punctate and moderately sparsely clothed with brownish hairs. Anterior face of front tibiae impunctate, outer margin not crenate, first tarsal segment shorter than second; apex of hind tibiae fimbriate with moderately short, unequal spinules, first tarsal segment shorter than the combined length of the two following, tibial spurs subequal, longer than the first tarsal segment Length, 3 mm.; breadth, 1·5 mm.

The type, probably a male, is deposited in the collection of the U.S. National Museum. Mexico: Colima (*Conradt*).

The spinules on the apex of the hind tibiae are equal except for two or three longer ones at widely spaced intervals. This species traces to group I–d and *A. inutilis* in Horn's tables. *A nubilus* agrees with the description of *A. inutilis* in many respects, but the latter has a smooth instead of trituberculate head. It is not closely related to any of the Mexican species.

Aphodius nigroclavus, sp. n.

Elongate, parallel, convex; black shining; tarsi and anterior margin of clypeus dark piceous, antennal club black, opaque. *Head* three-fourths as wide as pronotum, moderately convex, clypeal suture not visible, finely, moderately densely punctate throughout, sides and base with moderately coarse, dense punctures conspicuously intermixed with the finer; clypeus broadly, feebly emarginate and obtusely rounded on each side of the emargination, sides feebly arcuate, sinuate before genae; genae obtusely rounded, not prominent. *Pronotum* three-fourths as long as wide; sides feebly arcuate; base evenly arcuate, marginal line distinct and entire; hind angles obtuse, broadly rounded; extremely finely, sparsely

punctate throughout, with coarser, moderately dense punctures intermixed which are less dense at middle. *Elytra* slightly wider at base than prothorax, slightly widened posteriorly; disk moderately finely striate, striae moderately coarsely, densely punctate; intervals flat, somewhat alutaceous, extremely finely, moderately sparsely punctate; scutellum punctate basally. *Mesosternum* shining, alutaceous, coarsely, densely punctate, not carinate; metasternum with a very fine, shallowly impressed, longitudinal line, moderately densely, finely punctate and with a few coarser punctures posteriorly; abdomen finely alutaceous, rather coarsely, densely punctate, smoother at middle, clothed with sparse, brownish hairs. Anterior face of front tibiae impunctate, outer margin feebly crenate, first tarsal segment as long as second; apex of hind tibiae fimbriate with rather short unequal spinules, first tarsal segment longer than the longer spur and slightly longer than the combined length of the three following segments. Length, 4·5 mm.; breadth, 2 mm.

Type, ♂. Mexico: Real de Arriba, District of Temascaltepec, July 1933, about 6,000 feet (*R. L. Usinger* and *H. E. Hinton*). In the collection of the writer.

This species traces to group I–d and *A. cruentatus*, Lec., in Horn's tables. From this species it may be separated by its smaller size, coarsely and densely as well as finely and irregularly punctate disk, and extremely finely and irregularly punctate intervals. In *A. cruentatus* the disk is only finely punctate, and the intervals have two rows of fine punctures. Of the Mexican species, it is most closely related to *A. flohri*, Bates, but the latter is larger, less parallel, more shining, and has the base of the thorax bisinuate instead of evenly arcuate.

Aphodius chapini, sp. n.

Moderately elongate, subparallel, slightly convex; rufo-testaceous, shining; antennal club and tarsi paler, prothorax with a narrow, dark piceous, basal line. *Head* five-sevenths as wide as prothorax, slightly convex, coarsely, moderately densely punctate basally, more finely punctate anteriorly; clypeus broadly, feebly emarginate and obtusely rounded on each side of the emargination, sides feebly arcuate, very slightly sinuate before genae; genae broadly rounded, not prominent. *Pronotum* two-thirds as long as wide; sides feebly arcuate; base arcuate, bisinuate, not margined; hind angles obliquely truncate, the angles formed by the truncation broadly rounded; moderately coarsely, densely punctate, disk slightly more sparsely punctate. *Elytra* at base slightly narrower than prothorax, wider posteriorly; disk moderately coarsely striate, striae crenately punctate with moderately close, shallow punctures; intervals feebly convex, nearly impunctate; scutellum impunctate. *Mesosternum* opaque, alutaceous, extremely finely carinate; metasternum with a fine, longitudinally impressed line, moderately sparsely, finely punctate; abdomen finely, sparsely, indistinctly punctate. Anterior face of front tibiae sparsely punctate, outer margin feebly crenate, first tarsal segment longer than second; apex of hind tibiae fimbriate with unequal spinules, first tarsal segment longer than the longer spur and somewhat longer than the combined length of the three following segments. Length, 3·2 mm.; breadth, 1·4 mm.

The type is deposited in the collection of the U.S. National Museum. Panama: Porto Bello (*E. A. Schwarz*), 11.iii.1911, in horse manure. I take pleasure in naming this pretty little species for Dr. E. C. Chapin to whom I am indebted for many favours.

This species superficially resembles certain of the smaller *Ataenius*. It traces to group M in Horn's tables, but it is not related to any of the species

in this group. From *A. erythrinus*, Bates, and *A. xanthus*, Bates, it may be separated by the obliquely truncate instead of broadly rounded hind angles, and the even instead of conspicuously intermixed pronotal punctation.

Aphodius multimaculosus, sp. n.

Moderately elongate, robust, rather strongly convex; black, shining; clypeal margin and anterior pronotal angles obscure brown, elytra closely and irregularly maculated with brown, mouth-parts and tarsi piceous. *Head* four-fifths as wide as pronotum, moderately convex, moderately finely, densely punctate at base and middle, more coarsely and confluently punctate near anterior margin; clypeus broadly, feebly emarginate and obtusely rounded on each side of the emargination, sides feebly arcuate, slightly sinuate before genae; genae obtusely rounded, slightly prominent. *Pronotum* three-fourths as long as wide; sides feebly arcuate, slightly sinuate before base; base arcuate, feebly bisinuate, marginal line distinct and entire; hind angles obtuse, broadly rounded; finely, sparsely punctate throughout, with coarse, moderately dense punctures intermixed which are less dense at middle. *Elytra* at base as wide as prothorax, slightly wider posteriorly; disk moderately finely striate, striae moderately coarsely, moderately closely punctate; intervals feebly convex, finely alutaceous, finely, sparsely, irregularly punctate, at sides and apex the intervals are more convex and more coarsely, densely punctate; scutellum punctate basally. *Mesosternum* shining, alutaceous at sides, coarsely punctate anteriorly, not carinate; metasternum with a short, very finely impressed, longitudinal line, finely, sparsely punctate; abdomen alutaceous, finely, sparsely, indistinctly punctate, sparsely clothed with brownish hairs. Anterior face of front tibiae impunctate, outer margin feebly crenate, first tarsal segment shorter than second; apex of hind tibiae fimbriate with short equal spinules, first tarsal segment longer than the longer spur and slightly longer than the combined length of the three following segments; claws rather minute. Length, 4 mm.; breadth, 2 mm.

The type and one paratype. Mexico: near Real de Arriba, District of Temascaltepec (*R. L. Usinger* and *H. E. Hinton*), 13.vii.1933, 8,000 feet. Both specimens were taken in horse manure. The type and paratype remain in the collection of the writer.

The brown maculation is more evident in the paratype, and it is probable that a larger series would show considerable variation in this regard. This species traces to group F and to *A. consociatus* in Horn's tables, but it may be easily separated by its smaller size, greater convexity, and different type of elytral maculation. Of the Mexican species, it is probably most closely related to *A. ornatus*, Schmidt, but it is larger, the pattern of elytral maculation is different, and the striae do not approach the apex in the distinctive manner described for that species.

Aphodius spiniclypeus, sp. n.

Moderately elongate, robust, rather strongly convex; black, shining; antennal club black, opaque, tarsi dark piceous. *Head* five-sevenths as wide as pronotum, convex, coarsely and densely punctate basally, more coarsely, confluently and somewhat rugosely punctate anteriorly; clypeus broadly emarginate, acutely toothed on each side of the emargination; sides arcuate, slightly sinuate before genae; genae broadly rounded, not prominent. *Pronotum* three-fourths as long as wide; sides feebly arcuate, base nearly evenly arcuate, marginal line distinct and entire; hind angles obtuse, very broadly rounded; disk finely, sparsely punctate throughout, with moderately coarse, moderately

dense punctures intermixed which are more dense at sides. *Elytra* at base as wide as prothorax, wider posteriorly; disk moderately finely striate, striae very shallowly and rather sparsely punctate; intervals feebly convex, finely, sparsely punctate, more strongly convex and more densely punctate at sides and apex; scutellum sparsely punctate basally. *Mesosternum* shining, alutaceous, coarsely, densely punctate at base and middle, not carinate; metasternum with a fine, shallowly impressed, longitudinal line, moderately sparsely, finely punctate; abdomen alutaceous, finely, indistinctly punctate, clothed near apex with moderately long, brown hairs. Anterior face of front tibiae impunctate, outer margin crenate, first tarsal segment shorter than second; apex of hind tibiae fimbriate with short, equal spinules, first tarsal segment as long as the longer spur and nearly as long as the combined length of the three following segments. Length, 3·1–3·5 mm.; breadth, 1·5–1·8 mm.

The type (No. 3838, Mus. Calif. Acad. Sci.) and two paratypes. MEXICO: Real de Arriba, District of Temascaltepec, in July 1932 about 6,000 feet (*H. E. Hinton*). Five additional paratypes were collected by R. L. Usinger and the writer at the same locality in July 1933.

This species traces to group E in Horn's tables. It is closely related to *A. crassulus*, Horn, *A. crassuloides*, Fall, and *A. abusus*, Fall, but it is smaller than any of these and has no tubercles on the head. The teeth on the clypeus will serve to separate it from *A. indutilis*, Har.

Aphodius magnopunctatus, sp. n.

Moderately short, parallel, convex; black, shining; anterior angles of pronotum and elytra especially at base vaguely tessellated with rufo-piceous, antennal club fuscous, opaque, tarsi piceous. *Head* two-thirds as wide as pronotum, moderately convex, finely, moderately sparsely punctate, slightly more coarsely and densely punctate anteriorly; clypeus broadly, feebly emarginate and obtusely rounded on each side of the emargination, sides arcuate, very slightly sinuate before genae; genae very broadly rounded, not prominent. *Pronotum* three-fourths as long as wide; sides arcuate; base arcuate, distinctly bisinuate, marginal line distinct and entire; hind angles obtuse, broadly rounded; disk finely, sparsely punctate throughout, with very coarse, sparse punctures intermixed. *Elytra* at base as wide as pronotum, wider posteriorly; disk rather coarsely striate, striae moderately coarsely, crenately punctate; intervals nearly flat, finely, sparsely punctate, more densely punctate at sides and apex; scutellum punctate. *Mesosternum* alutaceous and subopaque at sides, not carinate; metasternum with a shallowy impressed, longitudinal line, sparsely pubescent with pale hairs, coarsely, moderately densely and also finely, sparsely punctate; abdomen alutaceous, finely, indistinctly, moderately densely punctate, sparsely clothed with long brownish hairs; anterior face of front tibiae impunctate, outer margin feebly crenate, first tarsal segment slightly shorter than second; apex of hind tibiae fimbriate with equal spinules, first tarsal segment as long as the longer spur and slightly shorter than the combined length of the three following segments. Length, 3 mm.; breadth, 1·5 mm.

The type, a male, and three paratypes were collected by R. L. Usinger at MEXICO: Real de Arriba, District of Temascaltepec (*H. E. Hinton*), in June and July 1933, at an elevation of about 6,000 feet. The type and paratypes remain in the collection of the writer.

One of the paratypes has the metasternum glabrous and less coarsely punctate. This species traces to group F in Horn's tables, but it is not related to any of the species in this group. It is closely related to *A. duplex*, Lec.,

but has no transverse clypeal ridge or trituberculate head. It is not closely related to any of the Mexican species.

Aphodius saylori, sp. n.

Moderately elongate, parallel, convex; black, shining; tarsi piceous, antennal club black, opaque. *Head* three-fourths as wide as pronotum, moderately convex, clypeal suture very finely impressed, finely, moderately sparsely punctate at base, slightly more coarsely and densely punctate anteriorly; clypeus broadly, feebly emarginate and obtusely rounded on each side of the emargination, sides arcuate, feebly sinuate before genae; genae broadly rounded, not prominent. *Pronotum* three-fourths as long as wide; sides feebly arcuate; base arcuate, feebly bisinuate, marginal line entire; hind angles obtuse, broadly rounded; middle nearly impunctate, sides extremely finely, sparsely punctate, with coarse, moderately dense punctures intermixed. *Elytra* at base as wide as pronotum, wider posteriorly; disk rather finely striate, striae moderately finely, moderately closely, crenately punctate; intervals nearly flat, extremely finely, sparsely punctate; scutellum finely punctate at base. *Mesosternum* moderately shining, alutaceous, finely punctate posteriorly, carinate; metasternum with a fine, longitudinally impressed line, finely, moderately densely punctate; abdomen finely alutaceous, finely, indistinctly, moderately sparsely punctate, clothed with a few pale hairs. Anterior face of front tibiae punctate, outer margin feebly crenate, first tarsal segment nearly as long as the combined length of the two following; apex of hind tibiae fimbriate with unequal spinules; first tarsal segment as long as the longer spur and nearly as long as the combined length of the three following segments. Length, 3–4·4 mm.; breadth, 1·5–2 mm.

The type (No. 3837, Mus. Calif. Acad. Sci.) and twenty-eight paratypes, Mexico: Real de Arriba, District of Temascaltepec (*R. L. Usinger* and *H. E. Hinton*), July 1933, at an elevation of about 6,000 feet. Paratypes are deposited in the collection of the U.S. National Museum and that of Mr. L. W. Saylor, for whom the species is named.

Some of the paratypes are slightly more coarsely and densely punctate than others, and it is probable that these are the females. A few specimens have the elytra and legs dark piceous. This species traces to *A. cavidomus*, Brown, in Brown's * recent revision of Horn's group I–b, but its black instead of reddish-brown colour will immediately separate it. It is not closely related to any of the described Mexican species.

* Brown, W. J., 1927, Canad. Ent., **59**: 162.

REVISIONAL NOTES ON CERTAIN SPECIES OF RHOPALOCERA (LEPIDOPTERA)

By Francis Hemming, C.B.E., F.R.E.S.

The following notes on the nomenclature of certain species of Rhopalocera have been made in the course of recent work.

Satyridae.

Maniola cecilia (Vallantin).

Epinephele ida, Esp. var. *cecilia*, Vallantin, 1894, Le Naturaliste, **16**: 260, "Algérie, Boudaroua, près Duvivier, Prov. Constantine."

The above name should in future be used for the collective species hitherto known by the name *Papilio ida*, Esp., [1784], which, as I have pointed out (Hemming, 1934, Stylops, **3** : 97), is invalid, as it is a homonym of *Papilio ida*, Cram., 1775. As shown above, the name *cecilia*, Vallantin, applies to the Algerian subspecies of this species. The Pyrenean (and south French) subspecies named *ida* by Esper I have renamed *aphrodite* (Hemming 1934, Stylops, **3** : 97).

Nymphalidae.

Argynnis euphrosyne lavinia nom. n. pro *Brenthis euphrosyne alpina*, Ebert, 1926 (Deuts. ent. Z. Iris, **40** : 33), which is a secondary homonym of *Argynnis dia*, Linn. var. *alpina*, Elwes, 1899 (Trans. ent. Soc. Lond., **1899** : 339).

Argynnis titania tana nom. n. pro *Argynnis amathusia*, Esp. form. *altaica*, Seitz, 1909 (Grossschmett. Erde, **1** : 232, pl. 68, fig. F 2), which is invalid, as it is a homonym of *Argynnis pales*, Schiff. var. *altaica*, Gr.-Gr., 1893 (Hor. Soc. ent. ross., **27** : 128).

Melitaea anastasia nom. n. pro *Melitaea beckeri*, Godman and Salvin, 1901 (Biol. cent.-Amer. Lep.-Rhop., **2** : 676, pl. 108, fig. 9, 10 ♂), which is invalid, as it is a homonym of *Melitaea artemis*, Fab. var. *beckeri* (Lederer MS.), Herrich-Schaeffer, 1851 (Syst. Bearb. Schmett. Europ., **6** : 1).

Lycaenidae.

Everes argiades seitzi (Wnukowsky).

Ununcula argiades seitzi, Wnukowsky, 1928, Deuts. ent. Z. Iris, **42** : 2.
Lycaena argiades, Pall. var. *amurensis*, Heyne, 1895, in Rühl, Pal. Grossschmett., **1** (15) : 751.

The name *seitzi*, Wnukowsky, should in future be used for the Amurland subspecies of *argiades*, Pall., in place of *amurensis*, Heyne, which is invalid, as it is a homonym of *Lycaena amanda*, Schn., var. *amurensis*, Staudinger, 1892 (in Romanoff, Mém. Lép., **6** : 162).

Lycaeides argyrognomon baldur nom. n. pro *Lycaena argyrognomon*, Bergstr. Rasse *balcanica*, Zullich (1929, Z. österreich. ent. Ver., **14** : 52), which is invalid, as it is a homonym of *Lycaena balkanica*, Freyer (1844, Neuere Beitr. Schmett., **5** (71) : 63, pl. 421, fig. 1 ♂, 2 ♀).

Agriades glandon marlene nom. n. pro *Lycaena orbitulus astorica*, Tytler, 1926 (J. Bombay nat. Hist. Soc., **31** : 585, pl. 1, fig. 8 ♀) which is invalid, as

it is a homonym of *Lycaena astorica*, Evans, 1925 (J. Bombay nat. Hist. Soc., **30** : 346). It is now generally agreed that the correct specific name of the insect formerly (wrongly) identified as *orbitulus*, Prunner, is *glandon*, Prunner.

Glaucopsyche alexis maritimalpium, Verity.

Glaucopsyche cyllarus, Rott., race *maritimalpium*, Verity, 1928, Bull. Soc. ent. France, **1928** : 141.
Glaucopsyche alexis selene, Hemming, 1934, Stylops, **3** : 98.
Lycaena alexis alpina, Turati & Verity, 1911, Bull. Soc. ent. ital., **42** : 260.

Since I proposed the name *selene*, Hemming, as a substitute for *alpina*, Turati & Verity (which is an invalid name), I have found that this subspecies has already been renamed by Verity who has called it *maritimalpium*, Verity. I regret this oversight and publish this note in order to sink the name *selene*, Hemming, as a synonym of *maritimalpium*, Verity, as quickly as possible.

PIERIDAE.

Ascia josephina (Godart).

Pieris josephina, Godart, 1819, Ency. méth., (Ins.) **9** (1) : 158.
Papilio amaryllis, Fab., 1793, Ent. syst., **3** (1) : 189.

This species should in future be called by the name *josephina*, God., as its older name *amaryllis*, Fab., is invalid, being a homonym of *Papilio amaryllis*, Stoll, 1782 (Uitl. Kapellen, **4** (33) : 210).

Pieris napi bryoniae (Hübner).

Papilio napi, Linn. var. *bryoniae*, Hübner, 1805, Samml. europ. Schmett., **1** : 62, no. 4 *nota*.
Papilio bryoniae, Hoffmansegg, 1806, Mag. f. Insektenk. (Illiger), **5** : 180.
Papilio bryoniae, Ochsenheimer, 1808, Schmett. Europa, **1** (2) : 151, *nota* 2.

The name of this well-known alpine subspecies of *Pieris napi* (Linn.), is invariably attributed to Ochsenheimer, but as the synonymy given above shows, he was not the first author to publish this name. It is not of great consequence, as all three authors cited above based their *bryoniae* upon the insect figured as *napi*, Linn., by Hübner ([1799], Samml. europ. Schmett., **1** pl. 81, fig. 407 * ♀). Hübner gave no locality for *bryoniae*, Hb.; Hoffmansegg wrote " Genève, Alpengegenden nicht niedriger als 1100 Toisen "; Ochsenheimer gave " Genève."

Pontia daplidice davendra nom. n. pro *Leucochloë daplidice orientalis*, Kardakoff (1928, Ent. Mitt., **17** : 268, pl. 6, fig. 9, 10 ♂), which is invalid, as it is a secondary homonym of *Pieris callidice*, Esp. var. *orientalis*, Alphéraky (1881, Hor. Soc. ent. ross., **16** : 359). As both *callidice*, Esp., and *daplidice*, Linn., are referable to *Pontia*, Fab., a new name is required for the above subspecies of *daplidice*, Linn.

Colias heos (Herbst).

Papilio heos, Herbst, 1792, in Jablonsky, Nat. Ins. (Schmett.), **5** : 213, pl. 114, fig. 5, 6 ♂.
Papilio aurora, Esper, 1784, Die Schmett., **1** (Bd. 2) Forts. Tagschmett. : 161, pl. 83, fig. 3 ♂.

This species should in future be called by the name *heos*, Herbst, as the older name, *aurora*, Esp., by which it is known to-day, is invalid, as it is a homonym of *Papilio aurora*, Cramer, 1780 (Uitl. Kapellen, **4** (25) : 18, pl. 299, fig. A, B).

PAPILIONIDAE.

Polydorus polyeuctes (Doubleday).

Papilio polyeuctes, Doubleday, 1842, Zool. Miscell. (Gray) (5) : 74.

This is usually treated as a subspecies of *Papilio philoxenus*, Gray (1831, Zool. Miscell. (Gray) (1) : 32), but as that name is invalid, being a homonym of *Papilio philoxenus*, Esper, [1780] (Die Schmett., **1** (Bd. 2) Forts. Tagschmett. : 25, pl. 54, fig. 3 ♀), the name *polyeuctes*, Dbl., should be adopted as the name for the collective species. The subspecies hitherto called *philoxenus*, Gray, has been named *Papilio philoxenus letincius*, Fruhstorfer, 1908 (Ent. Z., Frankfurt, **22** (18) : 72). As a result, the synonymy of the two Indian subspecies becomes :—

Polydorus polyeuctes (Dbl.).

(*a*) ssp. *polyeuctes* (Dbl.).
(*b*) ssp. *letincius* (Fruhst.) (= *philoxenus* (Gray)).

Papilio machaon hieromax nom. n. pro *Papilio machaon*, Linn. var. *montanus*, Alphéraky (1897, in Romanoff, Mém. Lép., **9** : 85), which is invalid, as it is a homonym of *Papilio montanus*, Prunner (1798, Lep. Pedemont. : 71).

Papilio alcmenor, Felder & Felder.

Papilio alcmenor, Felder & Felder, 1864, Reise Novara Rhopal. : 129, pl. 20, fig. D ♂ [‘♀’].
Papilio rhetenor, Westwood, 1841, Arcana Ent., **1** (4) : 59, pl. 16, fig. 1, 1A.
Papilio icarius, Westwood, 1847, Cabinet orient. Ent. : 5.

This species, at present known by the name *rhetenor*, Westw., should in future be called *alcmenor*, Feld. & Feld. The two earlier names are both invalid, as *Papilio rhetenor*, Westwood, is a homonym of *Papilio rhetenor*, Cramer, 1775 (Uitl. Kapellen, **1** (2) : 22) and *Papilio icarius*, Westwood, is a homonym of *Papilio icarius*, Esper, 1793 (Die Schmett. Suppl. Band 1 Abschn. Tagschmett. : 35, pl. 99, fig. 4 ♂). C. & R. Felder gave “ *India septentrionalis* ” as the locality for *alcmenor*, Feld. & Feld.

Iphiclides mandarinus (Oberthür).

Papilio glycerion, Gray var. *mandarinus*, Oberthür, 1879, Ét. Ent., **4** : 115.

This species is usually treated as a subspecies of *Papilio glycerion*, Gray, 1831 (Zool. Miscell. (Gray) (1) : 32), but that name is invalid, as it is a homonym of *Papilio glycerion*, Borkhausen, 1788 (Nat. europ. Schmett., **1** : 90). The collective species should in future be called *mandarinus*, Oberthür, the Chinese subspecies (type from Moupin) thus becoming the nominotypical subspecies. The subspecies from Sikkim hitherto known as *glycerion*, Gray, should in future be called *paphus*, de Nicéville, 1886 (J. asiat. Soc. Bengal, **55** (Pt. 2) (3) : 254, pl. 11, fig. 6 ♂). As a result the synonymy of these subspecies becomes :—

Iphiclides mandarinus (Oberthür).

(*a*) ssp. *mandarinus* (Oberthür).
(*b*) ssp. *paphus* (de Nic.) (= *glycerion* (Gray)).

Meandrusa sciron (Leech).

Papilio sciron, Leech, 1890, Entomologist, **23** : 192.

The name hitherto used as the name for the collective species, *gyas*, Westwood (*Papilio gyas*, Westw., 1841, Arcana Ent., **1** (3) : 41, pl. 11, fig. 1, from Assam), is invalid, as it is a homonym of *Papilio gyas*, Cramer (1775, Uitl.

Kapellen, **1** (3) : 45, 153). Similarly, the name *hercules*, Blanchard (*Papilio hercules*, Blanchard, 1871, C. R. Acad. Sci., Paris, **72** : 809, *nota* (2), from Mou-pin), in use for its Chinese subspecies, is invalid, as it is a homonym of *Papilio hercules*, Dalman (1823, Anal. Entom. : 40). The oldest valid name for any subspecies of this species is *sciron*, Leech, 1890, which also applies to the Chinese subspecies and has hitherto been treated as a synonym of *hercules*, Blanchard. This should, therefore, now be adopted as the name for the collective species. The Indian subspecies, hitherto known as *gyas*, Westwood, should be called *lachinus*, Fruhstorfer (1902, Deuts. ent. Z. Iris, **14** : 342). This was described from specimens from Darjeeling which cannot be separated subspecifically from those from Assam which Westwood named *gyas*. As the result of these changes, the synonymy of this species stands as follows :—

Meandrusa sciron (Leech).

(*a*) ssp. *sciron* (Leech) (= *hercules* (Blanchard), and *porus* (Strecker)). West China.
(*b*) ssp. *lachinus* (Fruhst.) (= *gyas* (Westw.)). Sikkim—Assam.
(*c*) ssp. *aribbas* (Fruhst). Upper Burma—Dawnas.

Zerynthia hypsipyle (Schulze).

Papilio hypsipyle, Schulze, 1776, Naturforscher, **9** : 221 and *nota*.
Papilio hypsipyle, Fabricius, 1777, Gen. Ins. : 265.
Papilio hypermnestra, Scopoli, 1763, Ent. Carn. : 149.
Papilio polyxena, Schiffermuller, 1775, Schmett. Wien : 162.

The two oldest names for this species are both invalid. *Papilio hypermnestra*, Scopoli, 1763, must be regarded as a homonym of *Papilio hypermnestra*, Linn., 1763 (Amoen. Acad., **6** : 407). Nothing is known of the date of publication of Scopoli's *Ent. Carn.* beyond the fact that it appeared in 1763. It must, therefore, be assumed to have been published on the 31st December of that year. As regards the article by Linnæus in the *Amoen. Acad.*, the position is that this was originally a thesis which was examined on the 23rd June, 1763. This thesis was subsequently published with other theses as part of volume **6** of the *Amoen. Acad.*, the preface to which is dated 16th September, 1763. In this form it must, therefore, have been published after that date. It is, however, practically certain that in accordance with the then current practice this thesis was published separately before the appearance of the volume of collected theses, which, from the date of the preface, it may be certainly assumed, was sent to the printer by 16th September, 1763. The original thesis was, therefore, probably published on some date between 23rd June and 16th September, 1763. It may, therefore, be concluded that the date of publication cannot be later than the latter date. In any case, it is clear that volume **6** of the *Amoen. Acad.* must be regarded as having been published before Scopoli's *Ent. Carn.* For the material for deciding this point, I am indebted to Mr. F. J. Griffin, the Society's Registrar.

The name *Papilio polyxena*, Schiff., 1775, falls as a homonym of *Papilio polyxena*, Cram., 1775 (Uitl. Kapellen, **1** (5) : 85) and of *Papilio polyxena*, Meerburgh, 1775 (Zeldzam. Gewassen, pl. 41). All these names were published in the same year, but precedence should be given to those of Cramer and Meerburgh over that of Schiffermuller, as they were accompanied with illustrations, while Schiffermuller's insect was not figured and was only very inadequately described.

The present insect should, therefore, be called *hypsipyle*. That name, it should be noted, ought to be attributed not (as is usually the case) to Fabricius, but to Schulze by whom it was first published. Schulze, who attributed the

name to Fabricius (in MS.) proposed it as a *nom. nov.* pro *Papilio hypermnestra*, Scopoli. The type locality of *Papilio hypsipyle*, Schulze, is, therefore, Carniola, the locality of *Papilio hypermnestra*, Scop.

Zerynthia hypsipyle creusa (Meigen).

Thais creusa, Meigen, 1829, Syst. Beschr. europ. Schmett., **1** (4) : 161, pl. 42, fig. 1.
Papilio cassandra, Geyer, [1827–30], in Hübner, Samml. europ. Schmett., **1**, pl. 185, fig. 910–11 ♂, 912–13 ♀.
Zerynthia demnosia, Freyer, 1831, Neuere Beitr. Schmett., **1** (2) : 15, pl. 7, fig. 2.

No text was published by Geyer and there is thus no direct evidence regarding the locality in which the insect which he named *cassandra* was taken. Meigen stated that his *creusa* was taken in Italy, the specimen figured being in Herr Geeger's collection. Of *demnosia*, Frr., Freyer says that he received his specimens from Herr Buringer under the MS. name "*demnosia*, Dahl." As regards their locality, he said that they were taken "in Litorale." Important information on this point is afforded by Herrich-Schaeffer (1845, Syst. Bearb. Schmett. Europa, **1** : 141, 142) who confirmed Freyer's statement that Dahl was the author of the name *demnosia* and added that Dahl brought back "many hundred examples of *demnosia* from Florence." Herrich-Schaeffer placed *creusa* as a synonym of *cassandra*, Geyer, and attributed it also to Dahl. Treitschke (1834, in Ochsenheimer, Schmett. Europa, **10** (1) : 84) stated that *creusa* and *cassandra* were synonymous and that Dahl was the author of both names. It thus appears that Dahl, who was an energetic collector and dealer in insects at that time, was the author in MS. of all the three names under consideration. The question to be determined is whether the specimens to which Dahl gave these names all came from the same locality (*i.e.* from Florence). On this, the following evidence is available. The insects figured under these names by Geyer, Meigen, and Freyer are all much alike and appear to belong to the same subspecies. Two of them certainly came from Italy, *demnosia*, Frr., having been taken at Florence, and *creusa*, Meigen, in "Italy." As regards the third, *cassandra*, Geyer, there is Treitschke's statement that it is identical with *demnosia*, Frr. These considerations, coupled with the fact that Dahl was the author (in MS.) of all these names, appear to me to establish conclusively that the names *cassandra*, Geyer, *creusa*, Meigen, and *demnosia*, Frr., all refer to specimens taken by Dahl at Florence.

Staudinger (1901, Cat. Lep. ed., **3** : 3) after examining the original figures concluded that they all referred to the same insect to which he applied the name *cassandra*, Geyer, sinking *demnosia*, Frr., and *creusa*, Meigen, as synonyms. Since his time, the dates of publication of the works concerned have been further studied. Sherborn has examined Freyer's *Neuere Beitrage* and Meigen's *Syst. Beschr.* His conclusions as regards the former have been embodied in his *Index Animalium*, and as regards the latter have been published by Griffin (1931, Ann. Mag. Nat. Hist. (10) **8** : 421). The dates of Hübner's *Sammlung* (and Geyer's continuation) have formed the subject of a paper by myself (Hemming, 1931, Trans. ent. Soc. Lond., **79** : 493–504). In the light of the evidence thus collected, *creusa*, Meigen, is found to be the oldest name, to which the others, *cassandra*, Geyer, and *demnosia*, Freyer, should, therefore, be referred as synonyms.

Parnassius apollo clarius (Hübner).

Papilio clarius, Hübner, 1805, Samml. europ. Schmett., **1** : 61, *nota* 6.
Doritis apollo, Linn. var. *sibirica*, Nordmann, 1851, Bull. Soc. imp. Nat. Moscou, **24** (2), pl. 11, fig. 1 ♀.
Doritis apollo, Linn. var., Nordmann, 1851, *ibid.*, **24** (2) : 423.

The very large subspecies of *apollo*, Linn., figured as var. *sibirica* by Nordmann in 1851 was named *clarius* by Hübner in 1805, and this name should in future be used for this subspecies. Hübner gave " Russland " as the locality of *clarius*, Hb. Nordmann's type of *sibirica*, Nordm., was taken at Irkutsk.

Parnassius phoebus palamedes nom. n. pro *Papilio delius*, Esper, [1805], (Die Schmett. Suppl. Band, 1 Abschn. Tagschm. : 114, pl. 115, fig. 5 ♂), which is invalid, as it is a homonym of *Papilio delius*, Drury, 1782 (Ill. nat. Hist., **3**, Index et 18). It is now generally agreed that this well-known European *Parnassius* is a subspecies of that from Siberia named *Papilio phoebus* by Fabricius in 1793 (Ent. syst., **3** (1) : 181), the identity of the latter having been definitely established by reference to the figure quoted by Fabricius from Jones' MS. *Icones* (Pict. 2, tab. 2, fig. 2) cited by Fabricius.

Parnassius ariadne (Kindermann MS.) Lederer.

Parnassius ariadne (Kindermann, MS.) Lederer, 1853, Verh. zool.-bot. Ver. Wien, **3** : 354.
Doritis clarius, Eversmann, 1843, Bull. Soc. imp. Nat. Moscou, **16** (3) : 539, pl. 9, fig. 1 A, B ♂, C ♀.

This name should be brought into use for this species in place of *clarius*, Ev., as that name is a secondary homonym of *Parnassius apollo clarius* (Hb., 1805) (see above).

Parnassius eversmanni lacinia nom. n. pro *Parnassius eversmanni altaica*, Verity, 1911 (Rhop. pal. : 319, pl. 64, fig. 19 ♂), which is invalid, as it is a homonym of *Parnassius phoebus*, Fab., forme *altaica*, Ménétriés, 1859 (in Schrenck, Reis. Forsch. Amur-Lande, **2** (1) : 12).

Five species of Parnassius, *Fab., commonly alleged to have been named by Ménétriés in 1849.*

There are five species of *Parnassius*, Fab., which are given in all catalogues as having been named by Ménétriés on a plate (pl. 4) supposed to have been published in the fourth volume of Siemaschko's *Russk. Fauna*. Sherborn has, however, never seen this plate, and no copy is known in any library in this country or in any of the large libraries on the Continent. After careful consideration, I have come to the conclusion (which is shared by those whom I have consulted) that this plate was never published and that the numerous references to it in the literature are due to its having been cited by Ménétriés (who very probably had the original drawing for it) in the first part of his *Enum. Anim. Mus. Pet. Lep.* published in 1855. There is clearly no justification for continuing to cite these names as having been first published on this mythical plate and they should, therefore, be referred to the first occasion on which they were actually published. The names in question, and the references to their place of first publication are as follows :—

(a) *Parnassius phoebus intermedius*, Mén.

Parnassius intermedius, Mén., 1855, Enum. Anim. Mus. Pet. Lep., (1) : 72 (Siemaschko, pl. 4, fig. 1 *ined.*).

(b) *Parnassius phoebus* (Fab.), ab. *sedakovii*, Mén.

Parnassius sedakovii, Mén., 1855, Enum. Anim. Mus. Pet. Lep., (1) : 71 (Siemaschko, pl. 4, fig. 2 *ined.*).

(c) *Parnassius nordmanni*, Nordmann.

Doritis nordmanni, Nordmann, 1851, Bull. Soc. imp. Nat. Moscou, **24** (2) : 423, pl. 13, fig. 1, 2 ♂, 3 ♀ (Siemaschko, pl. 4, fig. 4 *ined.*).

(d) *Parnassius eversmanni*, Mén.

Parnassius eversmanni, Mén., 1855, Enum. Anim. Mus. Pet. Lep., (1) : 73, pl. 1, fig. 2 ♂ (Siemaschko, pl. 4, fig. 5 *ined.*).

(e) *Parnassius eversmanni wosnesenskii*, Mén.

Parnassius wosnesenskii, Mén., 1855, Enum. Anim. Mus. Pet. Lep., (1) : 74, pl. 1, fig. 3 ♀ (Siemaschko, pl. 4, fig. 6 *ined.*).

I have been unable to trace what species is supposed to have been figured by Ménétriés as fig. 3 on pl. 4 of Siemaschko's work.

HESPERIIDAE.

Hasora chromus (Cramer).

Papilio chromus, Cram., 1780, Uitl. Kapellen, **3** (24) : 163, 174, pl. 284, fig. E.
Papilio alexis, Fab., 1775, Syst. Ent. : 533.

This species should in future be called by the name *chromus*, Cram., as the earlier name, *alexis*, Fab., is invalid, being a homonym of *Papilio alexis*, Poda, 1761 (Ins. Mus. Graec. : 77).

Epargyreus clarus (Cramer).

Papilio clarus, Cram., 1775, Uitl. Kapellen, **1** (4) : 66, pl. 41, fig. E, F.
Papilio tityrus, Fab., 1775, Syst. Ent. : 532.

This species should in future be called by the name *clarus*, Cram., because *tityrus*, Fab., is invalid, being a homonym of *Papilio tityrus*, Poda, 1761 (Ins. Mus. Graec. : 77). Preference should in any case have been given to *clarus*, Cram., as, having been published in the same year as *tityrus*, Fab., it was illustrated by Cramer, while no figure was given by Fabricius for *tityrus*, Fab.

Pyrgus cynarae (Boisduval).

Syricthus cynarae, Boisduval, 1840, Gen. Index. europ. Lep. : 36, no. 294 *nota*.
Papilio cynarae, Freyer, 1842, Neuere Beitr. Schmett., **4** (59), pl. 349, fig. 2 ♂.
Hesperia cinarae, *id.*, 1842, *ibid.*, **4** (59) : 104.
Hesperia cinarae, Rambur, 1842, F. ent. Andal., **2**, pl. 8, fig. 4, 5.

As shown above, this name should in future be attributed to Boisduval (and not, as at present, to Rambur) and should be spelt *cynarae* (and not *cinarae*). Boisduval gave " Taganrok " as the locality, and Freyer " Sarepta." There is no text to Rambur's plate.

Carterocephalus silvicola (Meigen).

Hesperia silvicola Meigen, 1829, Syst. Beschr. europ. Schmett., **2** (2) : 65, pl. 55, fig. 7 A, B ♂, C ♀.

This name should be brought into use, as expressly proposed by Meigen, to replace the name *Papilio silvius*, Knoch (1781, Beitr. Insektenges., **1** : 71, pl. 5, fig. 1, 2) which is invalid, as it is a homonym of *Papilio sylvius*, Poda (1761, Ins. Mus. Graec. : 77).

Ochlodes sagitta nom. n. pro *Augiades sylvanoides*, Leech (1893, Butt. China, Japan, Corea (2) : 604, pl. 41, fig. 4 ♂), which is invalid, as it is a secondary homonym of *Hesperia sylvanoides*, Boisduval (1852, Ann. Soc. ent. France, (2) **10** : 313). As the two species are now found to be congeneric, a new name is required for the one more recently described.

Ochlodes venata alexandra, Hemming.

Ochlodes venata alexandra, Hemming, 15th May, 1934, Stylops, **3** : 99.
Ochlodes venata, Brem. & Grey, race *esperi*, Verity, 21st May, 1934, Ent. Rec., **46** (5), Suppl. : (13).
Papilio sylvanus, Esper, 1777, Die Schmett., **1** (Bd. 2) Forts. Tagschmett. : 149.

In a recent paper I pointed out (Hemming, 1934, *in* Gen. Names brit. Ins. : 39) that *Papilio sylvanus*, Esper, was an invalid name, as it is a homonym of *Papilio sylvanus*, Drury, 1773, and consequently that the correct name for the collective species is *Hesperia venata*, Bremer & Grey. As I was dealing only with British insects, I did not then propose a new name for *Papilio sylvanus*, Esp., but I have since re-named it *Ochlodes venata alexandra*, Hemming. This name was published in the May 1934 number of *Stylops*, which in accordance with the strict rules of that journal was on sale on the 15th of the month. Verity, observing from the first of the papers referred to above that a new name was required, has proposed the name *esperi*, Verity. This appeared in a supplement published with the May number of the *Ent. Rec.* This number was received by subscribers (*e.g.* the Royal Entomological Society of London, Mr. N. D. Riley, and myself) on 22nd May, 1934, having been posted on the 21st May 1934. The latter date must be taken as the date of publication. The name *esperi*, Verity, is thus a synonym of *alexandra*, Hemming.

A CORRECTION

By Howard E. Hinton.

Aphodius colimaensis, nom. n.

Aphodius nubilus, Hinton, 1934, Stylops, **3** : 188.

As the name *Aphodius nubilus* has been used before (Panz., Faun. Germ., 58 : 3) for *A. distinctus*, Mull., the species is here renamed *A. colimaensis*, Hntn.

NOTES ON PLATYSTICTIDAE (ODONATA) OF THE NEOTROPICAL REGION

By J. Cowley, F.R.E.S.

The only representative of the Platystictidae in the Neotropical Region is the genus *Palaemnema*, Selys (1860), which has recently been revised by Calvert (1931 and 1934); in order to facilitate comparison with Calvert's descriptions I have used his terminology.

Palaemnema martini, sp. n.

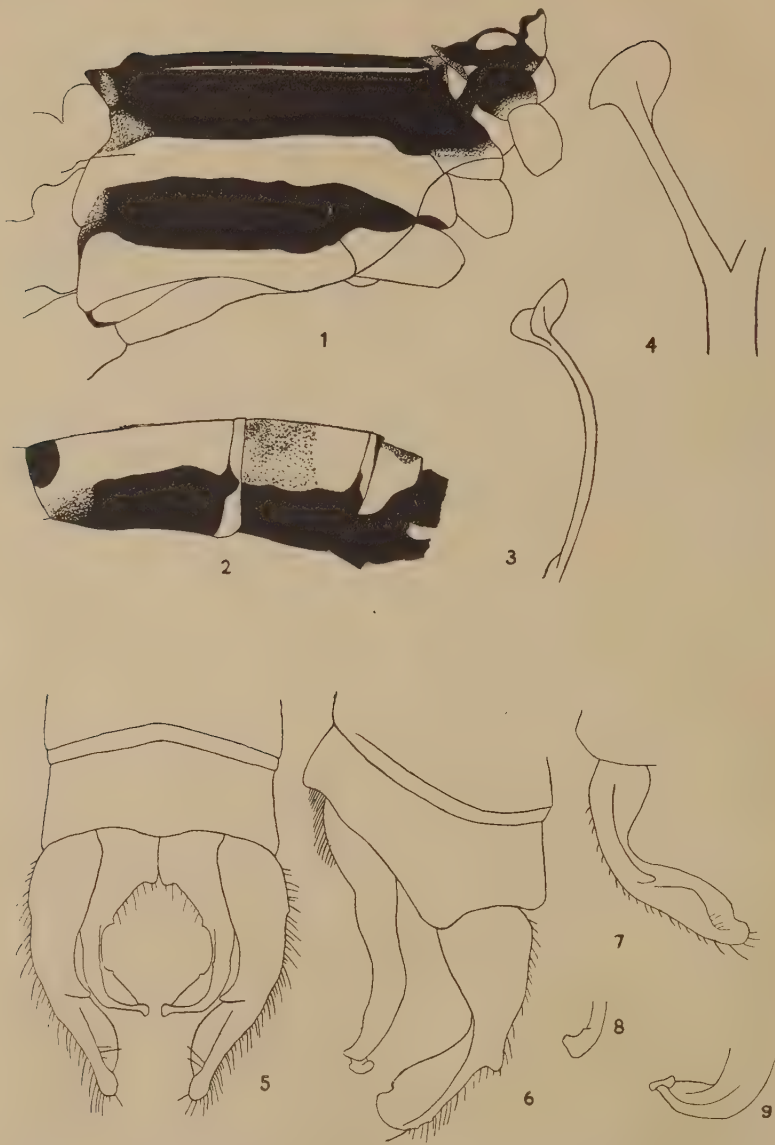
♂. Lateral extremities of the transverse occipital carina rounded. *Labium* yellowish; labrum cream-coloured, narrowly black anteriorly; genae and bases of mandibles cream-coloured; ante- and post-clypeus cream-coloured; frons black; first segment of antennae black with a pale apical ring, second segment yellowish-brown, third segment black, paler apically; at each lateral ocellus an exterior lateral yellowish-brown spot; anterior to the transverse occipital carina a yellowish-brown subrectangular area, extending laterally to the end of the carina, anteriorly to the posterior border of the vertex; eyes brown; rest of head black.

Pronotum: anterior lobe pale yellow, with a mid-dorsal black stripe; median lobe dark brown, with a lateral rounded blue spot; posterior lobe dark brown dorsally, yellowish-brown posteriorly, with an anterior lateral triangular spot blue. Propleuron dark brown, narrowly yellowish-brown inferiorly.

Mesepisternum black, with a yellow antehumeral stripe occupying the ventral four-fifths, 0·1 mm. wide at mid-height; mesepimeron with the anterior three-fourths black, continuous with that of the mesepisternum, together 0·98 mm. wide at mid-height, not reaching the obsolescent interpleural suture posteriorly, and becoming narrowly dark brown dorsally, the posterior fourth of the sclerite pale blue; mesinfraepisternum with the anterior two-thirds black, the posterior third pale blue, continuing the interpleural pale stripe; metepisternum with the anterior half pale blue, continuous with that of the mesepimeron, enlarged at the wing-bases to reach the metapleural suture posteriorly, the posterior half of the sclerite black; metepimeron with the anterior half dark brown, continuous with the black of the metepisternum, together 0·75 mm. wide at mid-height, the posterior half of the sclerite yellow; metinfraepisternum anteriorly and dorsally with a small black spot, continuous with the metapleural black stripe, the rest yellow; sternum yellow without any dark markings (fig. 1). Coxae and trochanters yellow, rest of the legs pale yellowish-brown, darker dorsally and apically.

Abdomen: segments 1 and 2 brown, each with a lateral yellow stripe extending from base to apex; segment 3 brown with a lateral yellow stripe on the basal fourth; segments 4–7 brown with a narrow transverse basal yellow ring, extending laterally up to one-fourth of the length of the segment; segments 8–10 pale brown, evidently blue in life, 8 with a basal black spot and a black lateral stripe occupying the apical four-fifths, the basal fifth obscure brown; 9 and 10 each with a lateral black stripe extending their whole length and with small dark brown, ill-defined, basal dorsal spots, divided medially on 9 (fig. 2).

Wings hyaline, not coloured at the apices; postnodals: 17 (left), 18 (right), fore-wings; 16, hind-wings; nodal sector arising: fore-wings, just distad to the seventh, or half-way between the seventh and eighth, postnodal; hind-wings, just distad to or at the sixth



FIGS. 1–9.—*Palaemnema martini*, sp. n., type ♂.—1, thoracic colour-pattern, right side; 2, colour-pattern of abdominal segments 8–10, left side; 3, right profile view of terminal filament of penis; 4, ventral view of right terminal filament of penis; 5, dorsal view of abdominal appendages; 6, left profile view of same; 7, supero-internal (dorso-mesal) view of left superior appendage; 8, posterior (caudal) view of apex of right inferior appendage; 9, postero-supero-internal (caudo-dorso-mesal) view of same.

postnodal; ultranodal sector arising at: fore-wings, the ninth or eighth postnodal; hind-wings, seventh postnodal; or, in cells behind the median vein proximad to the stigma: 8 or 9 fore-wings, 10 hind-wings; upper sector of the triangle ending: at 2 or 3 cells beyond the level of origin of the ultranodal (3 or 4 marginal cells), fore-wings; $4\frac{1}{2}$ or 5 (7 or $8\frac{1}{2}$) cells, hind-wings; stigma surmounting more than one cell, fore-wings; more than two or more than one, hind-wings. The right hind-wing has two basal postcostal cross-veins close together in the position of the normal cross-vein.

Terminal filaments of *penis* of form B (figs. 3, 4). Superior appendages with the ventral margin not angulate where the appendage enlarges, superior tooth situated at 0·6 of the appendage length, apex of the appendage not excised; inferior appendages without a basal tooth, but with a small distinct internal tooth at one-half their length (figs. 5–9).

Abdomen, 40 mm.; hind-wing, 26·5 mm.; costal margin of stigma: fore-wings, 0·95 mm.; hind-wings, 1·15 mm.

♀ unknown.

Type: 1 ♂. Peru: La Merced, 775 m., Prov. Tarma, Dep. Junín (*Dr. P. Martin*). In the author's collection.

Named for Dr. Paul Martin, of Lima, in appreciation of his services to the study of the Peruvian insect fauna.

This species runs out in Calvert's key (1931) to rubric MM (*peruviana* and *melanostigma*), but does not agree with either of the rubrics for these two species. It is closely related to *P. peruviana*, Ris (1918), with which it agrees in the absence of the basal tooth of the inferior appendages, and in the general form of the appendages. It may be distinguished from *peruviana* by the following characters: pale antehumeral stripe longer; fused black humeral and interpleural sutural stripes narrower, so that the mesepimeron is not entirely black; a dorsal basal black spot on segment 8, with the lateral black stripe occupying the apical four-fifths; dorsum of segment 10 pale coloured (probably blue in life); apical lamella of the superior appendages not so angulate; inferior appendages with a small internal tooth at one-half their length; apex of inferior appendages differently shaped.

Palaemnema azupizui, Calvert (1931).

Peru: 1 ♂, Puerto Inca, Río Pachitea (*Dr. P. Martin*).

This specimen agrees with the original description, except that the thoracic colour-pattern is more distinct, the antehumeral stripe is represented by a small inferior rounded spot, 0·2 mm. long, and the dark colour is more clearly defined and of greater extent (figs. 10, 11). Postnodals: 19, fore-wings; 17, hind-wings; nodal sector arising: fore-wings, at the seventh postnodal; hind-wings, at the sixth; ultranodal sector arising at: fore-wings, the eighth or ninth postnodal; hind-wings, the eighth; or in cells behind the median vein proximad to the stigma, fore-wings, 11 and 10; hind-wings, 9; upper sector of triangle ending distad to the level of origin of the ultranodal sector: fore-wings, 2 or $1\frac{1}{2}$ cells (2 and 1 marginal cells); hind-wings, $4\frac{1}{2}$ (7) cells; stigma surmounting more than one cell in all wings.

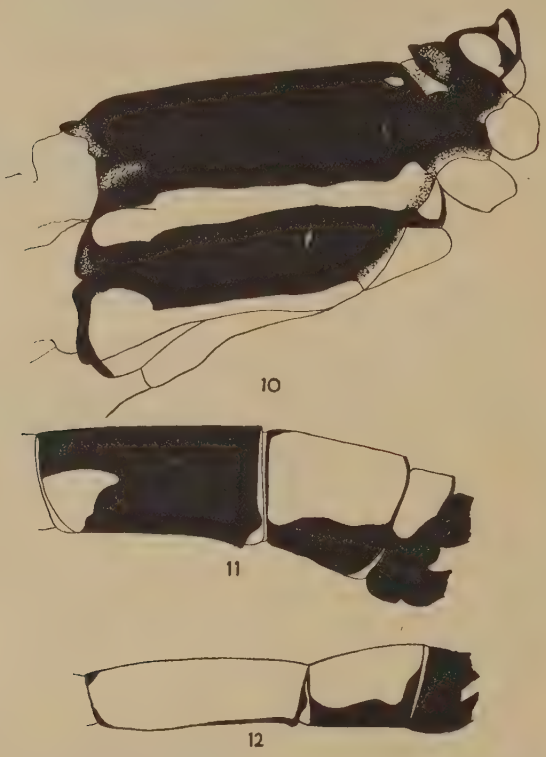
Abdomen, 38 mm.; hind-wing, 26 mm.

Palaemnema clementia, Selys (1886).

Peru: 1 ♂, Chuchuras, 325 m., Prov. Pasco, Dep. Junín (*Dr. P. Martin*).

The thoracic colour-pattern is intermediate between Calvert's (1931) figs. 96 and 97.

Hitherto recorded from Colombia and Venezuela. This record considerably extends the area of distribution southwards.



Figs. 10–11.—*Palaemnema azupizui*, Calv., ♂.—10, thoracic colour-pattern, right side; 11, colour-pattern of abdominal segments 8–10, left side.
Fig. 12.—*Palaemnema clementia*, Selys, ♂, colour-pattern of abdominal segments 8–10, left side.

References.

Calvert, P. P., 1931, The generic characters and the species of *Palaemnema*. Trans. Amer. ent. Soc., **57**: 1–110, 2 figs., 21 pls.
——, 1934, Two Mexican species of *Palaemnema*. Trans. Amer. ent. Soc., **59**: 377–381.

NOTES ON THE LIFE HISTORY OF *DIXA BICOLOR*, WOOD (DIPT.)

By H. G. Wood, B.A.

In a previous paper (Wood, 1933) this species was assigned to the subgenus *Paradixa*, Tonnoir (1924, pp. 223). The types were described from material in alcohol, a medium unsatisfactory for the detection of minute hairs on specimens. A later examination of *dry* freshly-caught specimens of *Dixa bicolor*, Wood, revealed that there are 2–3 minute sternopleural hairs present, as there should be in the subgenus *Dixa*, s.str., but never in the subgenus *Paradixa*, Tonnoir (*vide* key, Edwards, 1930, p. 101 and 1932, p. 11, characters of subgenus *Dixa* and p. 13 characters of subgenus *Paradixa*). In addition, as previously stated (Wood, 1933, p. 156), the male hypopygium corresponds more with that of the subgenus *Dixa*, s.str., than with that of the subgenus *Paradixa*, Tonnoir, as the coxite is without a terminal styliform process. Consequently, *Dixa bicolor*, Wood, should be placed in the subgenus *Dixa*, s.str., instead of *Paradixa*, Tonnoir.

Dixa (*Dixa*) *bicolor*, Wood.

Larva with dorsal hair-crowns on each of the abdominal segments 3–7; with ventral ambulatory plates or " armatures of spines " on each of the abdominal segments 5–7.

Size of full grown larva : 6–6·5 mm.

General coloration umber-brown; whitish beneath; hook-like setae on the abdominal prolegs and the ambulatory plates jet black.

Head ochraceous with the lateral posterior margin black. Antennae bristleless, with the usual microscopical spinules (fig. 1*a*). Mouth-parts dark, with the two tufts of hairs of the labrum well developed, but not longer than the antennae. Mandibles (fig. 1*b*) with about ten stout tooth-like spines on the internal surface, situate just dorsal to the internal margin; with a single relatively long external terminal bristle placed on a pronounced tubercle; molar portion, *i.e.* basal internal portion, with one chitinised hooked tooth and five to six smaller chitinised teeth, the latter being situate just ventral to the internal margin. Maxillary lobe conical, about as long as the palpi, with a tuft of hairs on the inner terminal margin; maxillary palpi bristleless, with microscopical spinules similar to those of the antennae (fig. 1*b*).

Body with black bristles, situate at the anterior margin of the prothoracic sternite, directed forwards but not reaching beyond the head, arranged in the following order : 1. 1. 4. 1.—1. 4. 1. 1. A smaller bristle occurs on the lateral surface opposite the uppermost bristle of the above group. Additional bristles are situate as in fig. 2*a*, namely :— *Meso- and Metathoracic segments :* each with a pair near anterior lateral margin; smaller bristle on median ventral line near anterior margin. *Abdominal segment I :* pair on side of first prolegs; pair near dorsum of segment; single bristle on lateral surface between the above pairs. *Abdominal segment II :* single bristle on anterior surface of second proleg; another slightly dorsal to this; pair on dorsum of the segment with single bristles on either side. *Abdominal segment III :* single bristle on mid lateral surface; another near the mid ventral surface. *Abdominal segment IV :* single bristle on mid lateral surface. *Abdominal segment V :* pair just posterior to the outer edge of the armatures of spines. *Abdominal segment VI :* pair as above; two separate bristles on the mid lateral surface. *Abdominal segment VII :* three separate bristles, one just posterior to the outer edge of the armatures

of spines; the others on the mid lateral surface. *Abdominal segment VIII :* three closely placed bristles near the ventral posterior margin. Slightly anterior to the anus is an elongate stout black bristle on a tubercle, reaching to the apex of the caudal appendage; slightly dorsal to this are two more slender bristles one-half the length of the above bristle.

On each of the abdominal segments three to seven is a dorsal crown of stiff hairs, microscopically plumose towards the apices. The prolegs on the abdominal segment I

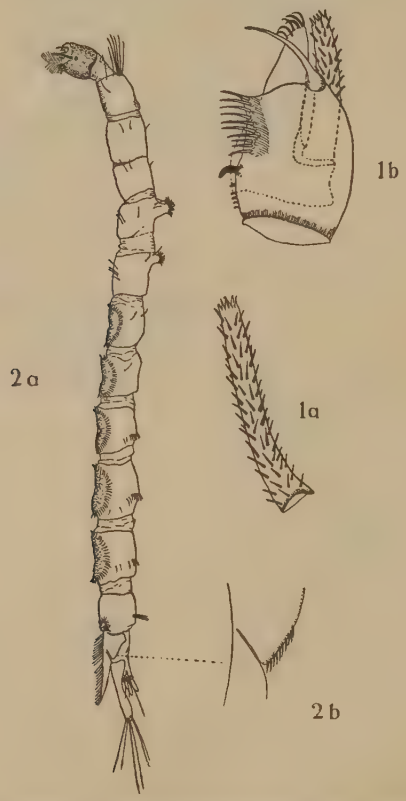


Fig. 1.—(*a*) Antenna of larvae; (*b*) mandible showing maxilla beneath, the base of which is represented by dotted lines.

Fig. 2.—(*a*) Lateral view of larva; (*b*) basal portion of lateral plate, enlarged (lateral aspect).

are larger and stouter than those on abdominal segment II; both pairs possess jet black hook-like setae at the apices

Ambulatory plates or armatures of spines situate near the posterior margins of the sterna of abdominal segments 5, 6 and 7 are composed of two groups of stout backwardly-directed spines. Each group consists of two juxtaposed rows of spines arranged as follows :—

Abdominal segment	Superior row	Inferior row
5.	(6)–7	6–(8)
6.	7	6–(8)
7.	4–(5)	(3) 4 (5)

In the above table the extreme number of spines on either side of the mean is given in brackets. The spines in the superior row are stouter yet shorter than the spines in the inferior row; the spines in the latter row being more slender and longer than those in the superior row.

Caudal appendage with six strong elongate microscopically plumose bristles near the apex. Spiracles round (fig. 3), between which occur six small tufts of branched hairs,

Fig. 3.—End of body of larva (dorsal view).

each outer pair arising from small closely-placed tubercles. Spiracular plates with definite fringes or combs of microscopically plumose setae. Lateral plates connected at their base by a chitinised plate, each bearing on the inner basal margin an elongate stout bristle on a large tubercle; combs of setae microscopically plumose. Basal portion of the lateral plate, viewed laterally (fig. 2*b*), with a row of small stout setae on the margin. Anal papilli soft, cutaneous, fusiform, four in number.

Pupa : Head free. Sheaths of palpi curved; antennal sheaths twice the length of the head capsule as in fig. 4*a*. Breathing horns are in the shape of a funnel with four sides,

Fig. 4.—(*a*) Dorsal view of head capsule of pupa, showing head and mouth-parts of developing imago within; (*b*) lateral view of pupa (dotted lines represent positions of the leg-sheaths beneath the wing-sheath).

at the bottom of which is a spiracle. The margin of the funnel is finely indented. Tarsal sheaths of legs I and II slightly curved, of leg III S-shaped; all the legs except the basal portions of I and II are concealed beneath the wing sheaths (fig. 4*b*). The pupa reveals no major characteristics which distinguish it from the typical generic ones.

Duration of the pupal stage : 3–4 days.

Localities.—Adults : 1 ♀. Bosch Kloof, Keerómsberg, Worcester, Cape Province; 3.ii.1933 (*H. G. Wood*). 1 ♀. Orange Kloof, Constantia, Cape Peninsula; 2.iii.1933 (*H. G. Wood*). 1 ♀. Platteklip, Cape Town; i.1932 (*Dr. K. H. Barnard*). ♂♂, ♀♀. Platteklip, Cape Town; 4.xii.1932 (*K. H. B.* and *H. G. W.*). ♂♂, ♀♀. Platteklip, Cape Town; 13 and 19.iv.1933 (*K. H. B.*). *Larvae and pupae :* Platteklip, Cape Town; 13, 19 and 23.iv.1933 (*K. H. Barnard*).

Habitat.—The adult flies frequent the edges of shallow pools of a rapidly-flowing mountain stream. The larvae and pupae occur in these pools, the former on and beneath decaying leaves near the pool margin. They often progress in their typical bending and straightening motion across the surface of the water on to the damp portions of the stones. The pupae rest just beneath the surface film of the water in the typical *Dixa* attitude (fig. 4*b*).

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Edwards, F. W., 1930, Diptera of Patagonia and S. Chile, Brit. Mus., **2** (3) : 77–119.
——, 1932, Genera Insectorum, **194** : 1–15.
Tonnoir, A. I., 1924, Rec. Canterbury Mus., **2** : 221–233.
Wood, H. G., 1933, Entomologist, **66** : 154–157.

KEYS TO SOME INDIAN GENERA OF CARABIDAE (COL.). IV. THE GENUS *CALATHUS*

By H. E. Andrewes, F.R.E.S.

The species of this genus are in India found only in the Himalayas; eight have hitherto been described, while one common palaearctic species has also been met with in the Pamirs; I have examined the types of all these. Twenty-five new species are here described, bringing the total to thirty-four, but a few of these will almost certainly have to be transferred later on to other genera; for the present all of them are grouped together pending the discovery of further material, which is required more particularly for the study of the ♂ characters. It will only be possible to fix the true position of these satisfactorily when additional specimens are available for examination. It is noteworthy that all the species with metallic coloration are found in the North East Himalayas, viz. Sikkim, Assam, and Northern Burma, closely allied species being already known from South-East China and Japan. I have not been able to find any characters to distinguish *Pristodactyla*, which is accordingly treated as synonymous with *Calathus*.

There is no necessity to recapitulate here all the generic characters, but in order to facilitate the descriptions of the Himalayan species some features are mentioned below, which either (i) are common to all of them, or (ii) have been found useful, owing to their variability, in the work of tabulation.

The *head* is generally small and the neck slightly constricted, the eyes rather flat, never very prominent, the frontal furrows short and slight, the genae usually inconspicuous, the palpi and antennae rather slender, the latter reaching the basal third or fourth of the elytra, though in some metallic species they extend beyond the middle, the mentum with a bifid tooth. The *prothorax* is more or less cordate or quadrate, generally convex and much wider than the head, the base nearly always wider than the apex, its sides often bordered and curving forwards towards the hind angles, the sides usually but not always bordered, generally bisetose, but more rarely with one seta only, or with none at all, rounded in front and often straight or slightly sinuate behind, the transverse impressions shallow or obsolete, the basal foveae very variable in depth, a raised area sometimes present on each side between them and the angles, though this sometimes is hardly more than a continuation of the general convexity outside the foveae. The *elytra* are occasionally flat, but generally moderately convex, the basal border bisinuate, *i.e.* separately emarginate on each side, and forming at the shoulder, where it joins the lateral border, a more or less sharp angle, sometimes also a small tooth, the striae varying greatly in depth and the intervals in convexity, an umbilicate pore generally, though not always, present on each side of the scutellum, from which striae 1 and 2 usually arise, interval 3 as a rule with two dorsal pores, but sometimes with only one, or with none, another pore at the point where striae 3 and 7 unite near apex, and yet another close to apex where striae 2 and 7 join. A microsculpture is always present, though sometimes faint on the head and prothorax; on the head the meshes are isodiametric, on the prothorax nearly always fine, faint and transverse, on the elytra variable. The underside is impunctate, the prosternal process sometimes with, but usually without a border, the metasternal process finely bordered, the metepisterna of variable form, the apical ventral segment with a single marginal seta on each side in both sexes, the metatarsal joints carinate

and with an outer sulcus, often slight and sometimes obsolete, claws always very clearly pectinate, the aedeagus of variable form, as shown in the illustrations.

The types of the new species are either in the British Museum, when so specified, or in my own collection.

A portion of the material dealt with in this paper was in my own collection, but a good deal of it came from the British Museum, and from the Forest Research Institute, Dehra Dun, while a few specimens were received from the Agricultural Research Institute, Pusa, and from the Indian Museum, Calcutta. I have to thank all these institutions for their assistance, and I am also indebted to one or two private collectors, namely Mr. H. G. Champion, Mr. H. Stevens, Mr. R. Oberthür, Prof. G. Hauser, and Mr. A. Jedlička, of whom the last named has very kindly allowed me to retain in my collection the types of several new species.

1(18). Prosternal process bordered at extremity.
2(17). Elytra with at least two dorsal pores.
3(14). Elytra with two dorsal pores only.
4(13). Elytra with an umbilicate pore on each side of the scutellary striole.
5(10). Elytra dull, at least in the ♀, with a microsculpture formed by isodiametric meshes, the front dorsal pore adjoining stria 3, the hind one adjoining stria 2; prothorax with wide, though not very deep foveae, the hind angles reflexed and without any raised area on each side between them and the foveae; metepisterna a little longer than wide.
6(9). Elytra with a slight tooth at shoulder; sides of prothorax straight or faintly sinuate behind, so that the hind angles, though a little obtuse, are moderately sharp; tibiae black.
7(8). Elytra with the basal border at shoulder and adjoining scutellum on the same level, an obtuse angle at shoulder, the striae fairly deep. Length 11–12 mm. . . . . *himalayae*, Bates.*

Punjab: Kulu (*Graham Young*) and Koty, Rotang Valley (*G. Babault*). United Provinces: Almora, Kali Valley and Dhauli Ganga (*R. N. Parker*); Gori River Gorge (*H. G. Champion*).

8(7). Elytra with the basal border at shoulder considerably in advance of the part adjoining scutellum, an acute angle at shoulder, the striae fine and lightly impressed. Length 8·5–9 mm.

Black: joints 4 to 11 of antennae and apex of palpi more or less ferruginous, tarsi piceous. *Head* with the neck unconstricted. *Prothorax* subquadrate, two-thirds wider than head, a fourth wider than long, base slightly arcuate, wider than apex, its sides with only a vestige of a border, not much contracted behind, the hind angles somewhat reflexed, the pore adjoining them on each side very conspicuous; basal foveae with traces only of fine puncturation. *Elytra* ovate, a third wider than prothorax, rather more than a half longer than wide, striae vaguely crenulate, outer ones very fine, intervals only slightly convex . . . . . **algens**, sp. n.

Kashmir: Khelanmarg, 11,000 feet (*T. B. Fletcher*, *M. Cameron*, and *C. F. C. Beeson*); Lolab Valley, 10,500 feet (*C. F. C. Beeson*). Numerous examples. Type in the British Museum.

9(6). Elytra without evident tooth at shoulder; sides of prothorax evenly rounded, so that the hind angles are clearly obtuse and somewhat rounded; tibiae dark ferruginous. Length 9 mm.

* 1891, *Entomologist*, **24**, Suppl.: 9.

Very similar to *algens* and of the same size, but both palpi and tibiae are ferruginous. The prothorax is more contracted behind, so that base is not much wider than apex. The elytral striae are moderately deep, and, although the outer ones are a little less impressed, they become no shallower towards apex . . **gelascens,** sp. n.

KASHMIR: Lidar Valley, Lidarwat, 9000 feet, 2 ex., Shisram Nag, 12,000 feet, 1 ex., and Tanin, 9700 feet (all *B. M. Bhatia*); Puish, 10,700 feet (*C. F. C. Beeson*), 1 ex. Type in the British Museum.

Another specimen from the "Kazi Nag Range, 8500 feet, Burdagi (*Middlemiss*)" in the Indian Museum, Calcutta, agrees in most of its characters with the other examples, but there are slight differences and I treat it as a variety.

10(5). Elytra very shiny in both sexes (in *braccatus*; the ♀ of *leurops* unknown), the meshes of the microsculpture transverse, dorsal pores adjoining stria 2; prothorax with deep foveae, the hind angles not reflexed and with a raised area on each side between them and the foveae; metepisterna as long as wide.

11(12). Eyes moderately prominent; sides of prothorax slightly sinuate before base; elytral striae fairly deep and indistinctly crenulate; antennae and legs dark ferruginous. Length 9·5 mm.

Black, shiny (♂). *Head* convex, with a faint neck constriction, eyes moderately prominent. *Prothorax* cordate, a little more than a half wider than head, a fifth wider than long, base much wider than apex, its sides bordered and slightly oblique, sides vaguely sinuate behind, hind angles a little obtuse but not much rounded; basal foveae small but deep, with vestiges only of puncturation, a distinct raised area on each side between them and margin. *Elytra* convex, elongate-oval, two-fifths wider than prothorax, a little more than a half longer than wide; striae fairly deep, impunctate, slightly shallower at sides, and much shallower close to apex **leurops,** sp. n.

KASHMIR: Uri, 1 ex. ♂, for which I am indebted to Mr. A. Jedlička.

12(11). Eyes flat; sides of prothorax straight before base; elytral striae fine and clearly crenulate; antennae, tibiae, and tarsi pale ferruginous, femora piceous. Length 8–8·5 mm.

Black, shiny (♂♀). *Head* with the neck unconstricted, eyes rather flat. *Prothorax* convex, subcordate, three-fifths wider than head, a fifth wider than long, base much wider than apex, its sides bordered and a little oblique, hind angles slightly obtuse, but not much rounded; basal foveae fairly deep, with one or two vague punctures, the surface slightly raised on each side between them and the angles. *Elytra* convex, oval, a third wider than prothorax, not quite a half longer than wide; striae rather fine, much shallower at sides and behind, scutellary striole vestigial . . . **braccatus,** sp. n.

KASHMIR: Pahlgam, 4 ex. ♂♀, in Mr. Jedlička's collection and in my own.

13(4). Elytra without umbilicate pore on each side of the scutellary striole, the dorsal pores adjoining stria 2. Length 8 mm.

Black, shiny (♂); palpi, joints 1 and 2 of antennae (rest fuscous), and tarsi ferruginous. *Head* small, neck only slightly constricted. *Prothorax* convex, subquadrate, two-fifths wider than head, very little wider than long, base truncate, bordered at sides, wider than apex, sides faintly sinuate before base, hind angles right and fairly sharp; basal foveae short but moderately deep, with a few vague

punctures, a raised area on each side, not quite reaching base, between them and the sides. *Elytra* moderately convex, elongate-ovate, a half wider than prothorax and slightly more than a half longer than wide, a sharp angle, but no tooth, at shoulder; striae moderately impressed, indistinctly crenulate, shallower at sides and behind; metepisterna as long as wide . . . . . **macer**, sp. n.

Kashmir: Khelanmarg, 11,000 feet (*T. B. Fletcher*), 2 ex. ♂♀. The type is in the British Museum.

14(3). Elytra with seriate pores, of which the front ones adjoin stria 3, the hind one stria 2, and an umbilicate pore on each side of scutellum; microsculpture isodiametric.

15(16). Prothorax piceous, evidently narrower than elytra; elytra usually with 5 pores on interval 3. Length about 8·5 mm. . *kollari*, Putzeys.*

Common throughout the Himalayas.

16(15). Prothorax red, barely narrower than elytra; elytra usually with 3 or 4 pores on interval 3. Length about 7·5 mm.

melanocephalus, Linnaeus †

Pamirs. (Common in the Palaearctic region.)

17(2). Elytra without dorsal pores or umbilicate pores adjoining the scutellum. Length 9 mm.

Black: palpi, antennae, prosternum, venter, and tarsi piceous. *Head* convex, eyes flat, neck slightly constricted. *Prothorax* convex, subcordate, nearly three-fifths wider than head, barely wider than long, base wider than apex, its sides narrowly bordered, sides faintly sinuate before base, hind angles sharply rectangular and projecting a little laterally; basal foveae moderately deep, slightly and very finely punctate, the surface not raised on each side between them and the angles. *Elytra* moderately convex, elongate-ovate, two-fifths wider than prothorax, a little more than three-fifths longer than wide, a right angle and a slight tooth at shoulder; striae fairly deep, finely and indistinctly crenulate, hardly shallower near apex; microsculpture isodiametric. Metepisterna a little longer than wide . . . . . **aquilo**, sp. n.

Sikkim, 2 ex. ♀♀, in the British Museum.

18(1). Prosternal process unbordered at extremity.

19(62). Prothorax with two lateral pores and setae.

20(47). Elytra with two dorsal pores adjoining stria 2; an umbilicate pore present on each side of the scutellum.

21(36). Metepisterna longer than wide (generally much longer, but in *xanthopus*, *tibetanus*, and *chambae* only a little longer).

22(35). Prothorax evidently wider than long, its sides at most faintly sinuate before base, the hind angles obtuse and generally rounded.

23(34). Prothorax distinctly contracted behind; elytral striae impunctate, though sometimes vaguely crenulate. Width less than 4 mm.

24(31). Striae of elytra hardly less deep behind than in front; antennae and legs mainly ferruginous or flavous. Length not exceeding 10 mm.

25(30). Striae of elytra moderately impressed, scutellary striole fairly long; basal foveae of prothorax wide, without any raised area on each side between them and the hind angles; upper surface black or piceous.

26(29). Eyes flat; prothorax three-fourths wider than head, widest at about middle, its sides moderately reflexed, more widely behind.

* 1873, *Ann. Soc. ent. Belg.*, **16** : 72. † 1758, *Syst Nat.*, Ed. X; **1** : 415.

27(28). Prothorax with its sides evenly rounded from apex to base; elytra a half longer than wide; microsculpture formed by meshes three times as wide as long. Length 8·5 mm.

Black, shiny (♀): palpi, joints 1 to 4 of antennae, lateral margins of prothorax, suture of elytra near apex, with the apical border, and legs more or less ferruginous. *Head* very small, convex, neck unconstricted. *Prothorax* convex, a third wider than long, base with its sides oblique and bordered, evidently wider than apex, hind angles obtuse and strongly rounded; basal foveae long and fairly deep, basal area with some slight puncturation, chiefly in the transverse sulcus. *Elytra* convex, ovate, about two-fifths wider than prothorax, a very obtuse tooth at shoulder; striae fairly deep, intervals a little convex on disk only. Metepisterna a half longer than wide . **sikkimensis,** sp. n.

Sikkim: Gopaldhara (*H. Stevens*), 1 ex. ♀.

28(27). Prothorax with its sides rounded in front, straight behind; elytra three-fifths longer than wide; microsculpture formed by meshes slightly wider than long. Length 8–9 mm.

Black, shiny (♂♀): palpi, antennae (a little darker towards apex), and legs flavous, lateral margins of prothorax ferruginous. *Head* small, convex, neck unconstricted. *Prothorax* convex, not quite a third wider than long, base with its sides bordered and oblique close to the angles, wider than apex, hind angles very obtuse, but blunt rather than rounded; basal foveae fairly deep, diverging in front and reaching middle, basal area with some very fine vague puncturation. *Elytra* convex, ovate, not quite a half wider than prothorax, a very obtuse angle at shoulder; striae moderately deep throughout, intervals a little convex on disk only. Prosternal process slightly bordered at sides; metepisterna a half longer than wide **pallipes,** sp. n.

United Provinces: West Almora and Ranikhet (*H. G. Champion*); Chakrata District, Sainj Khud, 6500 feet (*M. Cameron*), and Manjgaon, 6500 feet (*S. N. Chatterjee*). Type in the British Museum.

29(26). Eyes moderately prominent; prothorax a fourth wider than head, widest before middle, its sides narrowly reflexed throughout; microsculpture isodiametric. Length 8·5 mm.

Black, shiny (♂): palpi, antennae, apical border of elytra, and legs ferruginous. *Head* convex, indistinctly and very finely punctate-striate, neck unconstricted. *Prothorax* convex, a fourth wider than long, base not much wider than apex, its sides oblique, slightly emarginate at middle, bordered, the border just interrupted at middle, hind angles obtuse and somewhat rounded; basal foveae moderately deep, diverging in front, middle of base finely rugose-punctate, a few minute punctures in the foveae and lateral channels. *Elytra* rather flat, ovate, about a half wider than prothorax, nearly two-thirds longer than wide, border hardly angulate at shoulder; striae impunctate, moderately deep, intervals slightly convex, 7 narrower than the others. Metepisterna quite a half longer than wide **adelosia,** sp. n.

United Provinces: West Almora (*H. G. Champion*), 1 ex. ♂, in the British Museum.

30(25). Striae of elytra deep, scutellary striole faint, meshes of the microsculpture on average three times as wide as long; basal foveae of

prothorax deep, a raised area on each side between them and the angles; upper surface ferruginous. Length 8·75 mm.

Ferruginous, femora and tibiae flavous. *Head* convex, eyes not prominent, neck faintly constricted. *Prothorax* convex, quadrate, three-fifths wider than head, hardly more than a fifth wider than long, base a little wider than apex, slightly bordered at sides, sides gently rounded, with only a trace of sinuation before base, hind angles obtuse and a little rounded; basal foveae deep, nearly parallel, impunctate. *Elytra* moderately convex, ovate, only a little wider than prothorax, nearly three-fourths longer than wide, a slightly acute angle and a minute tooth at shoulder; striae fairly deep throughout, apparently impunctate, but under the microscope minutely punctate, the punctures appearing black against the light surface, 5 and 6 uniting a long way from apex, scutellary striole fine and faint, intervals moderately convex. Metepisterna a little longer than wide . . . . . **xanthopus,** sp. n.

North-West Provinces, 1 ex. ♂, which has been in my collection for many years. The elytra are slightly damaged and the specimen is possibly immature.

31(24). Striae of elytra much fainter behind than in front, microsculpture isodiametric; antennae and legs dull red or piceous. Length not less than 10 mm.

32(33). Prothorax with its sides faintly sinuate behind, the hind angles obtuse, reflexed, and rounded; elytral striae only moderately impressed on disk, intervals nearly flat. Elytra dark aeneous with a vague purplish tinge. Length 10 mm.

Black (except elytra), moderately shiny (♂): palpi, trochanters, and tarsi dark red, antennae piceous. *Head* convex, eyes flat, neck faintly constricted. *Prothorax* subcordate, moderately convex, a third wider than head, a fourth wider than long, base a little wider than apex, its sides oblique and bordered close to the angles; basal foveae moderately deep, containing a few punctures, base very finely punctate-striate. *Elytra* moderately convex, oval, not quite a half wider than prothorax, a little more than a half longer than wide, a very obtuse angle at shoulder; striae with traces only of fine crenulation, scutellary striole very short, surface rather glossy, front dorsal pore missing on the left elytron. Metepisterna a little longer than wide . . . . . **tibetanus,** sp. n.

Tibet: Tsangpo Valley, Temola, 14,000 feet (*F. Kingdon Ward*), 1 ex. ♂, in the British Museum.

33(32). Prothorax with its sides straight behind, the hind angles obtuse, but neither reflexed nor rounded; elytral striae fairly deep on disk, the intervals convex. Elytra black. Length 10–11 mm.

Black, shiny (♂♀): palpi, antennae, apical border of elytra, tibiae, tarsi, and apex of femora dull red. *Head* convex, eyes rather flat, neck moderately constricted. *Prothorax* convex, subcordate, nearly a half wider than head, a seventh wider than long, base truncate, wider than apex, its sides only vaguely bordered; basal foveae long, rather shallow, diverging in front, with hardly a trace of punctuation. *Elytra* convex, oval, a half wider than prothorax, a little more than three-fourths longer than wide, an obtuse angle at shoulder; striae with traces of fine crenulation, scutellary striole short but fairly deep, especially at apex. Metepisterna rather longer than wide . . . . . **championi,** sp. n.

United Provinces: Gori River Gorge, 5000–9000 feet (*H. G. Champion*), 3 ex. ♂♀. Type in the British Museum.

34(23). Prothorax only slightly contracted behind, its sides unbordered, somewhat reflexed and rather widely explanate behind; elytral striae fairly deep and clearly punctate, the microsculpture isodiametric, the surface fairly shiny in the ♂, dull in the ♀. Metepisterna a half longer than wide. Black: antennae, palpi, legs, and lateral margins of prothorax ferruginous. Width at least 4 mm. Length 10–11·5 mm. *crenatus*, Putzeys.*

United Provinces: Nainital, Ranikhet, and West Almora (*H. G. Champion*); Mussoorie, Mossy Falls (*M. Cameron*). Burma: Karen Hills (*L. Fea*).

35(22). Prothorax barely wider than long, its sides strongly sinuate behind, the hind angles very sharp, slightly acute, and projecting a little laterally. Length 10 mm.

Black, shiny: palpi, antennae, and tarsi dark ferruginous. *Head* small, convex, neck moderately constricted. *Prothorax* convex, cordate, two-fifths wider than head, a sixth wider than long, base truncate, a little wider than apex, vaguely bordered close to the angles; basal foveae long but shallow, diverging in front, with traces only of puncturation, a slight raised area on each side between them and margin. *Elytra* convex, elongate-ovate, a little more than a half wider than prothorax, three-fifths longer than wide, an obtuse angle and a small tooth on each side at shoulder; striae moderately impressed, finely and vaguely crenulate, much shallower at sides and near apex, scutellary striole rather long, intervals moderately convex (in one example three dorsal pores are present on the left elytron, one only on the right). Microsculpture formed by meshes on average quite twice as wide as long. Prosternal process bordered at sides; metepisterna a little longer than wide . . . . . **chambae,** sp. n.

Chamba: Dalhousie (*C. Somers Smith*), 3 ex. ♂♀.

36(21). Metepisterna fully as wide as long.

37(44). Prothorax with deep basal foveae and a raised area on each side between them and the hind angles, which though blunt are very little rounded; border of elytra at shoulder sharply rectangular and with a minute tooth, striae deep, impunctate, or at most vaguely crenulate.

38(41). Microsculpture of the elytra formed by meshes on average three times as wide as long. Length 8–9·5 mm.

39(40). Form wide, the prothorax a fifth wider than long, the elytra about a third wider than prothorax, scutellary striole vestigial. Length 8–9·5 mm.

Black, shiny (♂♀): palpi, antennae, lateral margins of prothorax and legs reddish-brown. Form robust, convex, eyes flat, prothoracic foveae and elytral striae both deep, microsculpture formed by meshes three times as wide as long, metepisterna as long as wide. (Occasionally three and even four pores are visible on interval 3.) . . . . . *clarus*, Andrewes.†

Punjab: Spiti, Pulga; Kulu, Kandi and Koty (all *G. Babault*); Simla Hills, Gahan, 7000 feet, Fagu, 8000 feet, and Kotgarh, 7000 feet (*M. Cameron* and *S. N. Chatterjee*); Seraj, Jibhi, 6000 feet (*H. G. Champion*). Kashmir: Uri (*C. Rost*). Sikkim (?). The specimens examined are somewhat variable,

* 1873, *Ann. Soc. ent. Belg.*, **16**: 82.

† 1924, Mission Babault, Carabidae: 101, t. 3, f. 4.

though all appear to belong to one species; the description is taken from the original examples found by Mr. Babault.

40(39). Form narrow, the prothorax barely wider than long, the elytra about a half wider than prothorax; scutellary striole short but distinct. Length 8·8–9 mm.

Black, shiny (♂♀): palpi, antennae, and legs dark ferruginous. *Head* with the eyes small and rather flat; neck a little constricted. *Prothorax* convex, subcordate, a little more than a half wider than head, base wider than apex, its sides slightly oblique, sides with a faint sinuation before base, hind angles slightly obtuse and moderately sharp; basal foveae only moderately deep (much less deep than in *clarus*), with traces only of puncturation in them. *Elytra* convex, ovate, about a half wider than prothorax, and as much longer than wide; striae fairly deep, impunctate, scutellary striole short but distinct, intervals moderately convex. Microsculpture formed by very variable meshes, on average much wider than long **edax,** sp. n.

Punjab: Simla, 2 ex. ♂♀, for which I am indebted to Professor G. Hauser.

41(38). Microsculpture of the elytra formed by isodiametric meshes. Length 6·5–7·5 mm.

42(43). Form wide, the elytra a third wider than prothorax, the tooth at shoulder (viewed from above) conspicuous; legs light ferruginous. Length 7·5 mm.

Black, shiny (♂♀): palpi and joints 1 to 3 of antennae (rest fuscous) ferruginous. *Head* with flat eyes, neck unconstricted. *Prothorax* convex, subquadrate, rather more than a half wider than head, a fourth wider than long, base much wider than apex, its sides bordered, sides vaguely sinuate quite close to the hind angles, which are slightly obtuse, but hardly rounded; basal foveae fairly deep, rounded, with one or two vague punctures only. *Elytra* convex, short-ovate, a half longer than wide; striae fairly deep, with traces only of crenulation, only a little shallower towards apex, scutellary striole short but fairly deep, intervals convex, dorsal pores minute, at a half and three-fourths . . . . . **minutalis,** sp. n.

"India," 2 ex. ♂♀, from the Bowring Collection in the British Museum.

43(42). Form narrow, the elytra a half wider than prothorax, the tooth at shoulder (viewed from above) inconspicuous; legs piceous. Length 6·5–7 mm.

Black, shiny (♂): palpi and joints 1 to 3 of antennae (rest fuscous) dark ferruginous. *Head* with flat eyes, neck unconstricted. *Prothorax* convex, subquadrate, a half wider than head, about a sixth wider than long, base wider than apex, its sides bordered, sides almost straight behind, hind angles obtuse and blunt, but not rounded; basal foveae elongate, deep, diverging in front, uneven and vaguely punctate. *Elytra* convex, short-ovate, a little more than a half longer than wide, a right angle and a minute tooth at shoulder; striae moderately deep, with barely a trace of crenulation, scutellary striole fairly deep, intervals convex, dorsal pores minute at about a half and five-sixths . . . . . **leptodes,** sp. n.

United Provinces: Chakrata, Kathian, 7000 feet (*C. F. C. Beeson*), 2 ex. ♂♂. Type in the British Museum.

(*To be continued.*)

KEYS TO SOME INDIAN GENERA OF CARABIDAE (COL.). IV. THE GENUS *CALATHUS* (*continued*).

By H. E. Andrewes, F.R.E.S.

44(37). Prothorax with moderately deep, wide, basal foveae, without any raised area on each side between them and the rounded hind angles; elytra with an obtuse though fairly sharp angle at shoulder, without tooth, striae lightly impressed, or, if more deeply, clearly punctate; microsculpture formed by transverse meshes.

45(46). Prothorax with base wider than apex; elytra brown, the striae lightly impressed and indistinctly crenulate, the basal border adjoining scutellum in advance of the humeral angle. Length 8 mm.

Brown above, piceous beneath: palpi, antennae, and legs ferruginous. *Head* small, convex, with rather flat eyes, neck unconstricted. *Prothorax* cordate, convex, nearly three-fourths wider than head, a half wider than long, base with its sides oblique and bordered, evidently wider than apex, sides straight behind, hind angles obtuse, reflexed, and moderately rounded; basal foveae vaguely rugose-punctate. *Elytra* convex, oval, rather more than a third wider than prothorax, and in the same proportion longer than wide; striae indistinctly crenulate, rather lightly impressed throughout, scutellary striole short, intervals slightly convex . **suffuscus,** sp. n.

Kashmir: Pahlgam, 1 ex. ♂, for which I am indebted to Mr. Jedlička.

46(45). Prothorax with base slightly narrower than apex; elytra brassy, the striae moderately deep and clearly punctate, the basal border at shoulder in advance of the part adjoining scutellum. Length 12 mm.

Metallic green, the elytra brassy, slightly cupreous or tinged with blue; basal joint of antennae and legs piceous; palpi and rest of antennae ferruginous. *Head* convex, eyes not prominent, neck slightly constricted, antennae very slender, reaching middle of elytra. *Prothorax* convex, subquadrate, a half wider than head, very slightly wider than long, apex a little wider than base, somewhat emarginate, the front angles fairly sharp, sides bordered and reflexed, rounded from apex to base, hind angles rounded but evident, the hind seta placed well in front of the angle; basal foveae finely punctate. *Elytra* convex, oval, two-fifths wider than prothorax, three-fifths longer than wide; striae moderately deep and finely punctate, shallower at sides and behind, scutellary striole very slight, intervals a little convex (in the cotype three dorsal pores are present on the right elytron) . . . . . **chlorodes,** sp. n.

Assam: Manipur, 1 ex. ♀. Burma: Ruby Mines (type), 1 ex. ♀. Both examples were collected by Doherty, and are in the British Museum.

47(20). Elytra without dorsal pores on interval 3 (but see *raptor*).

48(53). Elytra with an umbilicate pore on each side of scutellum (but see *lacerans* and *flavus*).

49(52). Prothorax subcordate, much narrower than elytra, which are brown or black with at least moderately deep striae, the microsculpture formed by isodiametric, or only slightly transverse meshes. Length at least 10 mm.

50(51). Prothorax a little wider than long, the sides at least slightly sinuate before base; elytral striae only vaguely crenulate; metepisterna as long as wide. Length 10–12 mm.

Black, ♂ shiny, ♀ dull: apical border of elytra, palpi, antennae, tibiae, tarsi, and apex of femora ferruginous. Form robust, convex, eyes rather flat, prothoracic foveae and elytral striae both fairly deep.
atrema, Andrewes.*

United Provinces: Gori River Gorge, 5000–9000 feet; Burphu, in the Gori Valley, 11,500 feet; Pindar Valley, 8000–11,000 feet; Sunderdhunga Valley, 8000–12,000 feet (all *H. G. Champion*).

51(50). Prothorax a little longer than wide, the sides not sinuate before base; elytral striae evidently crenulate; metepisterna a little longer than wide. Length 10 mm.
Brown, shiny (♂ only known): palpi, antennae, and legs ferruginous. Form a little more slender than that of atrema, the eyes rather more prominent, the prothorax with a rather wider marginal channel and a more reflexed border, the basal foveae a little longer, the elytral striae not quite so deep. . . . . *pectiniger*, Putzeys.†

"North India." Mr. René Oberthür kindly sent me for examination the two specimens in the Chaudoir collection on which Putzeys drew up his description.

The species is almost certainly identical with *Pristosia picea*, Motch. (1864, *Bull. Mosc.*, **1864** (2): 312; Andr. 1928, *Trans. ent. Soc. Lond.*, **76**: 11), the type of which (a fragment only) is in the Moscow University Zoological Museum.

52(49). Prothorax much wider than long, widest at base, and thence strongly contracted to apex, not much narrower than elytra, which are green and very shiny, the striae fine and finely punctate, the microsculpture formed by very fine and strongly transverse meshes. Length 9–10 mm.
Piceous, shiny: palpi, antennae, legs, and lateral margins of prothorax ferruginous. Form oval, as in the genus *Amara*, eyes flat, prothorax with all the normal impressions very shallow, the hind angles right, but a little rounded, elytra widest rather before middle, basal border strongly bi-emarginate, a slightly acute angle at shoulder, interval 5 widening out close to base.
amaroides, Putzeys.‡

Sikkim: Darjeeling; Gopaldhara (*H. Stevens*); Maria Basti (*L. Durel*); Pedong (*A. Desgodins*).

53(48). Elytra without an umbilicate pore on each side of scutellum (but in this respect, as mentioned below, abnormalities occur in four out of the five species). Microsculpture isodiametric. Metepisterna as long as wide.

54(61). Prothorax with its sides sinuate before base, the hind angles sharp, rectangular or only slightly obtuse, basal foveae present, colour of elytra black.

55(58). Eyes moderately prominent; elytra without any tooth at shoulder. Length over 11 mm.

56(57). Prothorax without any raised area on each side between the foveae and the hind angles; elytra with the striae fairly deep, at least on disk, the scutellary striole moderately developed. Length 13 mm.

* 1926, *Ent. mon. Mag.*, **62**: 77. † 1873, *Ann. Soc. ent. Belg.*, **16**: 86.
‡ 1877, *Stettin. ent. Ztg.*, **38**: 103.

Black, ♂ moderately shiny, ♀ dull: palpi dark ferruginous, apical joints of antennae and tarsi piceous. *Head* with the neck slightly constricted. *Prothorax* convex, subcordate, a third wider than head, a sixth wider than long, base truncate, slightly bordered at sides, hardly wider than apex, sides faintly sinuate behind, hind angles sharp, though slightly obtuse, each with a very small projecting tooth; basal foveae elongate, rather shallow, diverging in front, with only a vestige of puncturation. *Elytra* flat, elongate-oval, a half wider than prothorax, two-thirds longer than wide, an obtuse angle at shoulder; striae shallower at sides and behind, indistinctly crenulate (a single umbilicate pore present at base in the ♀ specimen on the left elytron); intervals moderately convex on disk (a single dorsal pore present in the ♀ on the right elytron).

glacialis, sp. n.

Kashmir: Khelanmarg, 11,000 feet (*C. F. C. Beeson*), 2 ex. ♂♀. The type (♂) is in the British Museum.

57(56). Prothorax with a raised area on each side between the foveae and the hind-angles; elytra with the striae lightly impressed, the scutellary striole rather slight. Length 11·25 mm.

The species hardly differs from *glacialis* except in the particulars specified above, but these give the insect quite a different appearance. The prothorax is slightly narrower and its base is very finely though sparsely punctate; the elytral striae are much more evidently crenulate and almost disappear near apex. A single dorsal pore is present at about two-thirds on the right elytron. . . . **raptor,** sp. n.

Kashmir: Khelanmarg (*M. Cameron*), 1 ex. ♂, in the British Museum.

58(55). Eyes flat; elytra with a tooth at shoulder. Length not exceeding 11 mm.

59(60). Prothorax with the foveae widening out and diverging in front, the base with only traces of fine puncturation; elytral striae fairly deep on disk and evidently crenulate. Length 11 mm.

Black, shiny (♂): palpi, antennae, tibiae, and tarsi dark ferruginous. Form rather narrow, the prothorax subquadrate, with sharply rectangular hind angles, the hind transverse impression well marked, the elytral striae deep near base, very shallow at apex. The author says of the third interval "versus apicem unipunctato (interdum impunctato)," referring presumably to apical and not dorsal pores. The only example seen is the ♂ type, which Mr. René Oberthür kindly sent for examination . . . . . *lacerans,* Bates.*

Kashmir: Goorais Valley (*J. H. Leech*).

60(59). Prothorax with fairly short but deep foveae, converging a little in front, the base evidently punctate; elytral striae only moderately deep and indistinctly crenulate. Length 9–10 mm.

Black, rather shiny (♂♀): palpi and antennae ferruginous; apex of femora, tibiae, and tarsi dark red. *Head* with the neck slightly constricted. *Prothorax* subquadrate, nearly three-fifths wider than head, a fourth wider than long, base truncate, bordered at sides, evidently wider than apex, sides moderately sinuate before

* 1889, *Proc. zool. Soc.,* **1889**: 214 (*Pristodactyla*).

base, hind angles right and sharp. *Elytra* moderately convex, a little more than a third wider than prothorax, about three-fifths longer than wide, a sharp angle at shoulder; striae a little shallower at sides and behind, intervals slightly convex (in one specimen there is a solitary dorsal pore on the right elytron). . . . **rubricrus,** sp. n.

Kashmir: Lidar Valley, Puish, 10,700 feet (*C. F. C. Beeson*), Shishram Nag, 12,000 feet, Lidarwat 9000 feet, and Tanin, 9000–9700 feet (all *B.M. Bhatia*); Lolab Valley, Nagmarg, 10,500 feet (*B.M. Bhatia*); Pahlgam (Mr. Jedlička's collection). A specimen from Nagaberan, 10,500 feet (*H. B. Bion*), in the Indian Museum, appears to be a narrow variety of the species.

61(54). Prothorax with its sides rounded, straight before base, hind angles obtuse and somewhat rounded, basal foveae obsolete, colour of elytra flavous. Length 9 mm.

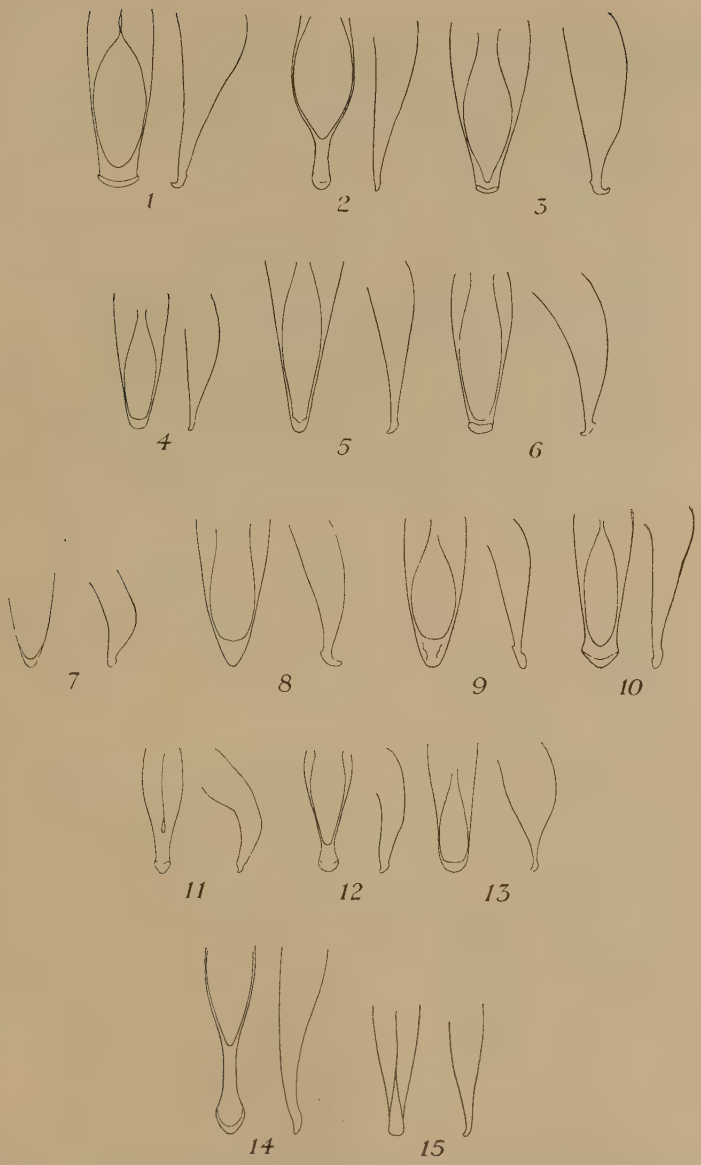
Flavous, shiny (♂), head piceous. *Head* with the neck faintly constricted, the eyes not prominent. *Prothorax* subquadrate, a half wider than head, a fifth wider than long, base wider than apex, its border obsolete; a slight oblique depression on each side of base, isolating a triangular explanate area adjoining the hind angles. *Elytra* convex, ovate, rather more than a third wider than prothorax, rather more than two-thirds longer than wide, an obtuse angle at shoulder, but no tooth; striae moderately deep throughout, minutely punctate, the punctures appearing black against the flavous surface, scutellary striole moderately developed; intervals somewhat convex, an umbilicate pore at base on right elytron only. Microsculpture isodiametric. Metepisterna as long as wide. . . . . **flavus,** sp. n.

"Cahar," 1 ex. ♂, from the Bowring collection in the British Museum. There are other specimens bearing this label, with the word written in ink on blue paper. Perhaps we should read "Cachar."

62(19). Prothorax with less than two lateral pores and setae; an umbilicate pore present on each side of scutellum.

63(64). Prothorax with a single lateral pore and seta on each side, placed on the inner side of the marginal channel at two-fifths from apex. Length 12 mm.

Black, with strong greenish reflections, shiny (♂): elytra aeneous, with the marginal channels darker; palpi and antennae dark ferruginous, legs piceous. *Head* with the neck faintly constricted, eyes not prominent, antennae slender, extending slightly beyond middle of elytra. *Prothorax* convex, subquadrate, more than a half wider than head, slightly wider than long, apex a little wider than base, slightly emarginate, the front angles blunt, though not much rounded, sides unbordered, rather widely reflexed, rounded from apex to base, hind angles reflexed, strongly rounded, but quite evident; basal foveae deep, adjoining the angles, with a few fine punctures. *Elytra* convex, oval, a fifth wider than prothorax, nearly three-fourths longer than wide, an acute angle at shoulder; striae shallow (rather more deeply impressed in the example from the Naga Hills), finely and clearly punctate, scutellary striole very fine; intervals nearly flat, two large dorsal pores at a little behind middle and five-sixths respectively. Microsculpture formed by meshes hardly wider than long. Metepisterna a little wider than long. Protarsi ♂ with large elongate joints. . . . . **acraeus,** sp. n.



FIGS. 1–15. Dorsal and lateral aspects of the aedeagus in Indian species of *Calathus*:—1. *tibetanus*, sp. n.; 2. *algens*, sp. n.; 3. *leurops*, sp. n.; 4. *braccatus*, sp. n.; 5. *glacialis*, sp. n.; 6. *rubricrus*, sp. n.; 7. *pallipes*, sp. n.; 8. *championi*, sp. n.; 9. *chambae*, sp. n.; 10. *edax*, sp. n.; 11. *melanocephalus*, L.; 12. *kollari*, Putz.; 13. *amaroides*, Putz.; 14. *himalayae*, Bates.; 15. *atrema*, Andr.

Assam: Manipur (type), 1 ex. ♂; Naga Hills, 1 ex. ♂ (both *Doherty*). The type is in the British Museum.

64(63). Prothorax without lateral pores or setae; a single dorsal pore present on each side, at or just behind middle of elytra. Microsculpture formed by strongly transverse meshes. Metepisterna as long as wide.

65(66). Form wide; prothorax with the apex very slightly emarginate, the front angles inconspicuous; elytra reddish-purple, a half longer than wide. Length 12 mm.

Black, with a faint greenish tinge, shiny (♀): joint 1 of the antennae and tibiae flavous, rest of antennae, palpi, and tarsi ferruginous. *Head* with the neck unconstricted, eyes rather flat, antennae reaching middle of elytra. *Prothorax* convex, subcordate, about a half wider than head and a fifth wider than long, base slightly emarginate, unbordered, a little narrower than apex, sides unbordered, rounded from base to apex, rather widely reflexed, more widely behind, hind angles obtuse and strongly rounded; basal foveae deep and rounded, with a few inconspicuous punctures. *Elytra* convex, oval, a half wider than prothorax, a sharp though slightly obtuse angle at shoulder; striae deep, very finely crenulate, scutellary striole short and fine; intervals convex, a slight depression on each side of the disk behind (in the type only). Meshes of the microsculpture about three times as wide as long. . **quadricolor,** sp. n.

Assam: Shillong, 6000 feet (*C. F. C. Beeson*), 1 ex. ♀; "Assam" (*W. F. Badgley*), 1 ex. ♀. Type (Shillong) in the British Museum.

At first sight more like a *Colpodes* than a *Calathus*, but the tooth of the mentum is deeply cleft, the fourth tarsal joint is emarginate only, and the claws are pectinate. Both specimens are unfortunately damaged, but no important organ is missing.

66(65). Form narrow; prothorax with the apex evidently emarginate, the front angles conspicuous; elytra brassy, three-fourths longer than wide. Length 12 mm.

Black, shiny: palpi, antennae, and (in one of the two specimens) lateral margins of the prothorax, dark ferruginous; legs more or less piceous. Very similar to *quadricolor* in most of its characters, but narrower (4 mm. against 4·8 mm.), and quite differently coloured. In the prothorax the sides are less widely reflexed, so that the marginal channel is narrower, especially in front, the hind angles, though strongly rounded, a little less obtuse, the basal foveae similar, but with hardly a trace of puncturation. The elytra are barely a fifth wider than the prothorax, with a slightly acute angle at shoulder, the striation similar. The meshes of the microsculpture are finer and much wider. . . . . **aereipennis,** sp. n.

Assam (*W. F. Badgley*), 2 ex. Type in the British Museum. The protarsi are unfortunately missing in both specimens.

ON THE GENUS *ELAEAGNA*, PASC. (COL. CURCUL.)

By Sir Guy Marshall, C.M.G., D.Sc., F.R.S., F.R.E.S.

Although the genus *Elaeagna* appears to be widely distributed in Australia, specimens are rare in collections, and it is noticeable that no species has yet been recorded from what is probably the best worked part of the continent, namely, New South Wales.

The Imperial Institute of Entomology has recently received from Mr. Alan P. Dodd, Officer-in-Charge of Prickly Pear Investigations, two new species bred from plants of the genus *Bassia* in South-west Queensland, and it has therefore seemed desirable to attempt a synopsis of the genus. Unfortunately of the four previously known species the three described by Lea are known to the writer only from the descriptions.

The types of the new species are in the British Museum.

Key to the Species of Elaeagna.

1(4). Joint 1 of funicle much longer than 2; punctures on pronotum shallow and almost concealed by the dense scaling; upperside of a uniform pale sandy colour; elytra not tuberculate dorsally.

2(3). Base of elytra truncate in the middle; antennal scape nearly as long as the first three funicular joints; punctures on pronotum smaller and closer . . . . . *squamibunda*, Pasc. 1870 (S. Australia).

3(2). Base of elytra feebly bisinuate, the sutural angle being slightly produced forwards; antennal scape scarcely as long as the first two funicular joints; punctures on pronotum larger and fewer *inepta*, Lea 1898 (Western Australia).

4(1). Two basal joints of funicle subequal; pronotum very deeply punctate; upperside dark brown or black with a few paler patches.

5(8). Intervals on elytra not tuberculate, without shiny granules dorsally, the sulci well defined and regular; punctures on pronotum containing a pale scale-like seta.

6(7). Funicle densely squamose; elytra 1·5 times the length of the prothorax, the punctures in the sulci large, round and distant, those in the first two sulci not smaller than the others, those on the declivity regular *humeralis*, sp. n. (Central Australia).

7(6). Funicle not squamose, simply setose; elytra about twice as long as the prothorax; the punctures in the first two sulci smaller and more distant than the others, which are larger, transverse and contiguous, those on the declivity somewhat irregular . *variolaris*, Lea 1898 (N.W. Australia).

8(5). Intervals on elytra distinctly tuberculate, the tubercles all bearing a small shiny granule, the sulci less well defined and partly irregular on the disk; punctures on pronotum containing a short narrow black seta.

9(10). Head and underside with shallow punctures that are concealed by the scaling; hind femora reaching only apex of abdomen; tubercles much more numerous on intervals 3 and 5 of elytra than on the others *nodipennis*, Lea 1913 (Victoria).

10(9). Head and underside with deep punctures that are conspicuous through the scaling; hind femora shortly exceeding the apex of the elytra.

11(12). Prothorax with the punctures on the basal half rounded, those on the pleurae containing a pale scale-like seta; elytra with intervals 2 and 4 more regular and with almost as many tubercles as on 3 and 5; antennae squamose; mesosternal receptacle not convex behind, its posterior face steeply declivous, broadly impressed on each side so that the lateral margins project backwards *bassiae*, sp. n. (Queensland).

12(11). Prothorax with the punctures on the basal half transverse, those on the pleurae containing a narrow black seta; elytra with intervals 2 and 4 somewhat irregular and with much fewer tubercles than on 3 and 5; antennae setose; mesosternal receptacle of the swallow's-nest form, convex behind, without impressions or lateral projections *doddi*, sp. n. (Queensland).

Elaeagna humeralis, sp. n.

♀. Derm black, with dense scaling; head brown, with a median whitish stripe and a small whitish spot on each side of it, or the whole disk whitish; prothorax variously mottled with black and light brown, with the following whitish markings: a triangular longitudinal patch in the middle of the base, a curved row of six spots round the apical margin, a small spot near the base in a line with interval 3 of the elytra and another in front of it beyond the middle; elytra mottled black and brown, with the suture entirely brown and the following whitish or pale sandy markings: a large apical patch, and a large transverse subquadrate humeral patch, reaching the base and lateral margin and extending inwards to the outer edge of interval 3; underside whitish or pale sandy with a large dark patch in the middle of the venter.

Head with the scattered punctures visible shallowly through the scales and each containing a recumbent pale seta. *Rostrum* sinuate laterally, as usual, with close deep punctures, which are less distinct on the basal half owing to the scaling. *Antennae* densely squamose; the two basal joints of the funicle equal, the remainder transverse and widening distally. *Prothorax* as long as broad, feebly rounded laterally or almost parallel-sided in the basal half, rapidly narrowed in front, but without any apical constriction; the dorsum slightly convex longitudinally, highest near the base, set with large close deep rounded punctures, each containing a scale-like pale seta, without any smooth median line; the punctures on the pleurae partly concealed by scaling and containing setae similar to those on the disk. *Elytra* 1·5 times as long as the prothorax, not sinuate behind the basal angles, parallel-sided to beyond the middle, with the base truncate dorsally; the sulci deep and regular, containing deep round separated punctures, which are smaller but still regular on the declivity; the intervals broad, uneven, as though composed of fused flattened tubercles, their margins sinuous, irregularly set with small scale-like recumbent pale setae, and the lateral intervals with rows of minute shiny granules. *Legs* pale sandy, the femora with two variable dorsal brown patches, the tibiae usually with a brown patch at the base, the tufts of setae on the lower surface of the tarsi fulvous. *Sternum* with the mesosternal receptacle convex on its posterior face and without impressions.

Length 6·5 mm., breadth 3 mm.

Northern Territory: Hermannsburg, 2 ♀♀, vii.1908 (*H. J. Hillier*).

The type specimen of this species was examined by Lea and identified as a colour variety of *squamibunda* (1913, *Trans. Roy. Soc. S. Austr.*, **37** : 366), but it is fairly certain that he had no specimen of the latter species before him at the time. In addition to the distinctions given in the key, *squamibunda* differs in having the mesosternal receptacle impressed on each side of its posterior face, and the setae on the lateral intervals of the elytra are elongate, whereas in *humeralis* they are very short and broad or even round.

It may be noted that Lea (1898, *Proc. linn. Soc. N.S.W.*, **23** : 180) erroneously described *squamibunda* as having ten distinct striae on the elytra, whereas the tenth row of punctures is actually reduced to a mere rudiment at the base and apex, as in all the other species of the genus.

Elaeagna bassiae, sp. n.

♂♀. Derm black, with dense dark brown scaling above and paler markings; head brown, with the following pale markings: a triangular patch in the middle of the vertex, a small spot on each side of it, and a small spot on each side of the forehead adjoining the rostrum; prothorax with the following pale markings: a curved row of four small spots near the apical margin, two similar discal spots in front of the middle, a small patch in the middle of the base and a blackish patch on each side of it; elytra with a large light brown apical patch and a smaller paler oblique patch at one-third from the base between striae 3 and 6, sometimes extending to the lateral margin but not to the base; underside pale sand colour, with the last three ventrites dark except at the sides and along the anterior margin of 5.

Head with deep separated punctures that are conspicuous through the scaling, the frontal fovea large. *Rostrum* with very deep rugose punctures and with an obtuse median carina on the basal half, which is less distinct in ♀; the basal half with brown scaling, a pale spot in the middle of the base and another on each side of the disk at one-fourth from the base. *Antennae* piceous, squamose; the funicle as in *E. humeralis*. *Prothorax* very similar to that of *humeralis*, except that the dorsal setae are black and narrow. *Elytra* only 1·4 times as long as the prothorax, subtruncate or very shallowly sinuate separately at the base, parallel-sided to beyond the middle, with the basal angles projecting slightly forwards to embrace the base of the prothorax, as usual; the sulci often slightly irregular on the disk, containing deep round separated punctures; the intervals with numerous small tubercles, each bearing a shiny granule and a small scale-like recumbent seta, except the lateral intervals and interval 1 which bear only small depressed granules; the tubercle at the base of interval 2 much larger than the others, subtriangular and produced inwards along the base almost to the suture; the basal tubercle on intervals 3, 5, 7 also somewhat enlarged. *Legs* with dense pale scaling, the femora usually with a brown band (containing a small dorsal black patch) at the apex and at the middle, the tibiae with a dark patch at the base. *Mesosternum* with the receptacle as described in the key.

Length 5—6 mm., breadth 2·4—2·8 mm.

QUEENSLAND: Cunnamulla, 3 ♂♂, 1 ♀, from stems of *Bassia birchii*, x.1933 (*A. P. Dodd*).

Elaeagna doddi, sp. n.

♂. Head marked as in *E. bassiae* except that the pale patch on the vertex is larger; prothorax with the pale spots on the anterior half as in *bassiae*, but in the basal half a large pale m-shaped discal marking (less distinct in the cotype); elytra blackish brown above, with a large pale patch on the declivity, a small pale spot just behind the scutellum, and another oblique one on intervals 4 and 5 at one-third from the base.

Very close to *E. bassiae*, but in addition to the distinctions given in the key, differing in the following characters:—*Rostrum* rather more rugosely punctate, especially in the basal half, where there is no median carina. *Prothorax* with the punctures smaller, as well as transverse, and with a distinct narrow median carina. *Elytra* with the basal tubercle on interval 3 larger than that on 2 (instead of *vice versa*); the setae on the tubercles narrow and black (instead of pale and scale-like).

Length 4·6—5·0 mm., breadth 2·1—2·4 mm.

QUEENSLAND: Goondiwindi, 2 ♂♂, from stems of *Bassia quinquecuspis*, iii.1934 (*A. P. Dodd*).

NEW SPECIES OF INDIAN CHRYSOMELIDAE (COL.)

By G. E. BRYANT, F.R.E.S.

(*Imperial Institute of Entomology.*)

MEGALOPINAE.

Temnaspis quadriplagiata, sp. n.

Flavous, pubescent; clothed with long flavous hairs, elytra with a black spot on the shoulders, and another larger patch behind the middle; the posterior femora armed with a large and small acute spine. L. 8 mm.

Parallel-sided, the head flavous, clothed with long flavous hairs, rugosely punctured, a median longitudinal patch between the eyes impunctate, the eyes not prominent, their inner margin triangularly notched; antennae flavous, extending just beyond the base of the elytra, the third joint the longest, and about equal to the two first together. Pro-

thorax flavous, about as broad as head, and not much broader than long, clothed with long flavous pubescence, and with scattered punctures, the anterior and posterior margins sulcate, and a feeble tubercle near the posterior angles. Elytra flavous, oblong parallel and rounded at the apex, twice as long as broad, slightly broader than the base of the prothorax, somewhat strongly but not closely punctured, and clothed with long flavous pubescence, a black spot on each shoulder, and a larger black patch just behind the middle, not touching the suture or side margin. Underside entirely flavous, clothed with fine flavous pubescence, rugosely punctured, the 2nd, 3rd and 4th ventral segments contracted in the middle, the legs flavous, clothed with long pubescence, the posterior femora strongly incrassate, with one long sharp tooth, and a small one near the apex; the tibiae all more rugosely punctured than the femora.

India: Dehra Dun, vi.1912, and vii.1913. 2 specimens.

More closely allied to *T. japonica*, Baly, than to the Indian species *T. assamensis*, Jac., and *T. downesi*, Baly, in which the eyes are very much more prominent.

Clytrinae.

Aetheomorpha coorgensis, sp. n.

Oblong ovate, fulvous; the base of the head, base of the prothorax and scutellum blue-black; elytra each with two spots at the base, two behind middle, and the apex blue-black; parts of the underside tinged with fuscous. L. 4½ mm.

Head impunctate, fulvous, with the base narrowly blue-black with a black median projection; eyes large and elongate; antennae with the three basal joints fulvous and the rest fuscous and serrate, extending to the base of the prothorax. Prothorax transverse, impunctate, the sides rounded and slightly narrowed in front, fulvous, with two irregular blue-black patches at the base, not meeting at the middle, a blue-black median spot in front of the scutellum. Scutellum triangular, blue-black, with the apical portion fulvous, impunctate; elytra fulvous each with two large blue-black patches or spots, two large patches at the base, two behind the middle, and the apex largely blue-black, and at the margin very narrowly connected to the median marginal patch; punctate striate, the striae being distinctly geminate. Legs fulvous; underside fulvous, the metasternum and parts of the ventral segments and pygidium tinged with fuscous.

India: Fraserpet, Coorg, vii.1930. Forest Research Institute Sandal Insect Survey, Nos. 417, 418.

Allied to *A. decemnotata*, Jac., but differs in the basal marking on the head, also the prothorax with blue-black markings, the elytral markings are stronger, with the apical portion entirely blue-black, also the elytral punctuation is more regular and not so coarse.

Gynandrophthalma flaviventris, sp. n.

Black; the elytra metallic blue-black with the apex flavous; the ventral segments of the abdomen flavous. L. 4 mm.

Elongate, rounded at the apex. Head black shining, clothed with short grey pubescence, a strong triangular impression between the eyes; clypeus black and shining, punctured, the base of the head impunctate; eyes rather large; antennae black with the three basal joints fulvous, the seven terminal joints serrate, extending to the base of the prothorax. Prothorax transverse cylindrical, the sides slightly contracted in front, surface entirely smooth, very shining. Scutellum black shining impunctate, triangular. Elytra metallic blue-black, the apex flavous, very finely and somewhat irregularly punctured. Legs black, long and slender, the tarsi long, with the first joint nearly equal in length to the two following; underside with the sternum black, the meso- and metasternum clothed with thick ashy pubescence; the ventral segments flavous, thinly clothed with pubescence.

India: Jawalagiri, North Salem, 17.iv.1931. Forest Research Institute Sandal Insect Survey, Nos. 436, 437; Ayur, North Salem, 11.vi.1930.

Allied to *G. delesserti*, Lac., but a larger species, and differs in the prothorax being entirely shining black, the colour not such a bright blue, and the apex not having a rounded flavous spot, but being entirely flavous.

Aspidolopha nigrocurvilinea, sp. n.

Black beneath, above fulvous. Prothorax with two semicircular black patches touching the base on either side, with a median fuscous spot at the base, in front of the scutellum. Elytra each with two black spots placed a little behind the middle. L. 4–5 mm.

Head black, a few fine punctures between the eyes, a band of pale pubescence in front of the eyes; clypeus finely punctured. Antennae fuscous, clothed with very fine pubescence, scarcely extending to the base of the prothorax, the fourth and following joints serrate, the basal joint much larger than the second and third. Prothorax slightly narrowed in front, median lobe broadly rounded, impunctate, fulvous, with two irregular semicircular black patches touching the base, but not extending to the side margins; a median fuscous spot in front of the scutellum. Scutellum large triangular, raised at the apex, black with the apex fulvous, the basal half clothed with grey pubescence. Elytra finely and remotely punctured, feebly striate towards the apex, slightly broader at the base than the prothorax, tapering to the apex, fulvous with two black spots on each a little behind the middle, one just touching the side margin, the other not touching the suture. Legs with the femora black, the tibiae and tarsi black clothed with ashy pubescence, the claws black; underside black clothed with dense ashy pubescence. ♂: L. 4 mm.; ♀: L. 5 mm.

India: Ayur, Denkanikota, North Salem, vi.1930, Forest Research Institute Sandal Insect Survey, Nos. 419, 420 and 421.

Allied to *A. thoracica*, Jac., but a smaller species (Jacoby's type measures 7 mm.), the markings different, no humeral spot, and the basal black margin to the prothorax is divided in the middle, forming two semicircular patches.

Aspidolopha ornaticollis, sp. n.

Fulvous, head and scutellum black, the latter with the apex fulvous. Prothorax with a transverse row of four black spots. Elytra with a humeral black spot, another in front of the middle of the suture, and an oblique lateral patch extending from the middle towards the apex, the lateral margins and suture narrowly fuscous. L. 2–3 mm.

Head black finely strigose clothed with fine ashy pubescence, the labrum and clypeus fulvous, a longitudinal impression between the eyes; antennae fuscous with the three basal joints fulvous, not quite extending to the base of the prothorax. Prothorax fulvous, with a transverse row of four black spots, the two median spots the larger, transverse, the sides rounded, median lobe very broad slightly produced, the surface coarsely punctured. Scutellum large triangular pointed, black with the apex fulvous, the basal half clothed with ashy pubescence. Elytra fulvous, with a black humeral spot, another black spot in front of the middle near the suture, and a lateral oblique patch narrowing towards the apex, the sides and suture narrowly fuscous, surface strongly punctate-striate, the apical portion impunctate; epipleurae produced at the sides. Legs fulvous; underside clothed with ashy pubescence, the meso- and metasternum fuscous, the ventral segments fulvous, the first and apical segments tinged with fuscous.

♀ with the abdomen more swollen and the apical ventral segment strongly notched.

India: Jawalagiri, North Salem, Forest Research Institute Sandal Insect Survey, Nos. 336, 337, 422, 423, and 424.

Allied to *A. interrupto-fasciata*, Jac., but of smaller size and different pattern, and with no trace of blue on head or scutellum. The length of Jacoby's type should be 4 mm., not 3.

CHLAMYDINAE.

Exema fulvitarsis, sp. n.

Black; the mouth-parts, basal joints of the antennae and the tarsi fulvous, head rugosely punctured. Prothorax with six longitudinal ridges. Elytra with tubercles and ridges, and strongly punctured. L. 3 mm.

Head flat, rugosely punctured, and with a slight median depression, labrum fulvous; antennae short, extending to the middle of the side margin of the prothorax, the six basal joints fulvous, and the five terminal joints fuscous, and more transverse, the first joint very long and stout. Prothorax strongly raised into a rounded elevation, closely and distinctly punctured, with six longitudinal ridges, the middle pair more distinct and parallel, the other two pairs running obliquely and joining this middle pair, behind the middle, the posterior pair being rather indistinct. Scutellum transverse and the hind angles strongly produced. Elytra much more deeply and coarsely punctured, more shining than the prothorax, with a complicated pattern of ridges and tubercles, a large median tubercle on the basal margin, a curved ridge running from between this tubercle and the scutellum, slanting to the suture, and at the centre of the suture joining a strong transverse tubercle, behind this two deep depressions extending not quite half-way to the apex, from which two parallel ridges run to the apex, expanding into tubercles, the sides of the elytra from behind the shoulders strongly compressed and rugose, and at the apex near the side margin a strong tubercle; underside black and rugose. Legs with the femora rugose and the tibiae smoother, all the tarsi fulvous.

INDIA: Jawalagiri, North Salem, 21.vi.1930, Forest Research Institute Sandal Insect Survey.

Allied to *E. indica*, Guér.

ON THE GENUS *ANTARGIDIUM*, MORICE (HYM. SYMPHYTA)

By ROBERT B. BENSON, M.A., F.R.E.S.

(*British Museum, Natural History.*)

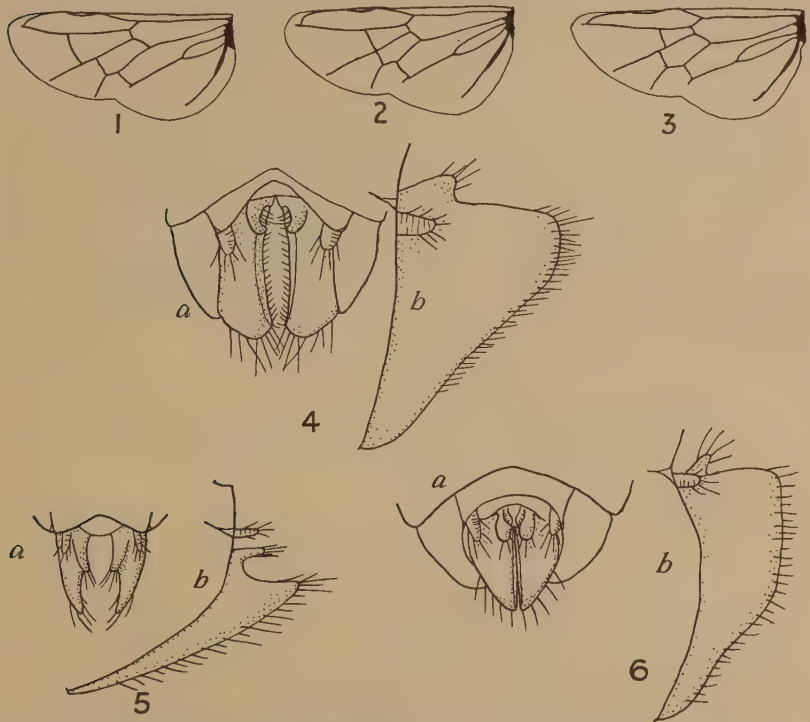
THE genus *Antargidium* was erected by Morice * for the species *Arge apicale*, W. F. Kirby.† The genus was considered very close to *Arge*, and was erected because *A. apicale*, W. F. Kirby, was smaller than any other known species of *Arge* and also because, according to Morice, the recurrent and cubital nerves in the hind-wing, unlike all other known ARGINAE, were interstitial. In all the other ARGINAE (except the Australian *Trichorhachus*) the cubital lay beyond the recurrent, and so was nearer to the margin of the wing. Unfortunately this description of the venation of the hind-wing of *A. apicale*, W. F. Kirby, is inaccurate. In the type specimens the recurrent lies beyond the cubital, and so it does for all the other specimens of this species in the British Museum. Two specimens, however, named by Dr. S. A. Rohwer as this species, but which for several other reasons undoubtedly represent a new species, were probably the specimens Morice looked at, as they have got the recurrent and cubital veins in the hind-wing interstitial. A second new species, in which the cubital lies beyond the recurrent, as in typical *Arge*, is represented in a small collection of sawflies brought to me by Miss L. F. Graham (Mrs Harris) from Canberra Museum. It is necessary therefore to redefine *Antargidium*.

* 1919, *Trans. ent. Soc. Lond.*, ~~1919~~ : 254.

† *Hylotoma apicale*, sp. nov. W. F. Kirby, 1894, *Ann. Mag. nat. Hist.*, (6) **14** : 45.

Antargidium, Morice (Argidae, Arginae).

Small species, 6 mm. or less in length, of sturdy build. *Head* slightly swollen behind the eyes; mouth-parts normal; clypeus with the front margin clearly excised and flat so that, though there is no furrow behind, it is distinct from the raised supraclypeal area; antenna short, in ♀ only about as long as the breadth of the head, in the ♂ about as long as the abdomen; funiculum and pedicellum very short; pedicellum about twice as broad as long; flagellum in ♀ slightly swollen in the middle, not flattened, but almost cylindrical and curved, with short close pile; in ♂ flagellum not swollen in the middle but flattened laterally with the side facing inwards covered with long hairs, while the side facing outwards has only short close pile; posterior ocelli in a line with eye-tangent; eyes converge slightly below;



Figs. 1–3.—Hind-wings of *Antargidium*, 1, *A. allucente*, sp. n.; 2, *A. dentivalvis*, sp. n.; 3, *A. apicale*, W. F. Kirby. Figs. 4–6.—Sawsheaths of *Antargidium*, 4, *A. allucente*, sp. n.; 5, *A. dentivalvis*, sp. n.; 6, *A. apicale*, a, dorsal view; b, lateral view.

malar space about as long as the length of the pedicellum; frontal area V-shaped, pointed in front, bordered generally by a clear carina, and in the middle depressed a little. *Thorax*: pronotum divided longitudinally each side by a furrow stretching in a direct line with the tegula and about parallel to the lateral margin of the pronotum; front lobe of mesonotum not divided by a median furrow. *Wings*: venation as in *Arge coeruleipennis*, Retz., except that the apical cell in both the fore- and hind-wing is smaller and that in the hind-wing the recurrent and cubital may be interstitial, or the recurrent may be nearer the apex of the wing than the cubital, or the cubital nearer the apex of the wing than the re-

current. *Legs*: hind femur in lateral view rather swollen in the middle so that the greatest breadth is about a third of the total length of the femur; middle and hind tibiae with a preapical spine about a third from the apex on the outer ventral side; basitarsus equal to or greater in length than the following three tarsal segments; claws simple. *Abdomen*: about as long as head and thorax together; tergum 1 with the hind margin emarginate in the middle. Sawsheath with a distinct dorsal tooth to each valve (figs. 4, 5 and 6). *Punctuation* very sparse, mostly absent. *Pubescence*: head, thorax and all except the basal terga covered with a short close pile.

The range so far as is known is limited to Queensland.

Type: *Hylotoma apicale*, W. F. Kirby.

This genus is undoubtedly very close to *Arge* from which it can be separated by its ocelli being in the eye-tangent, by the very short antenna and particularly the pedicellum which is twice as broad as long, and by the small apical cells to the wings.

Some of the more aberrant species of *Arge* may approach *Antargidium* in one or other of these characters. In several species of *Arge*, for instance, the ocelli are actually in the eye-tangent (*A. proxima*, E. André) and others approach very close to this condition. The pedicellum in several species of *Arge* may be very short and even broader than long, but not to the extent of twice the length. From *Caloptilia* the South American genus, also close to *Arge*, but in which the ocelli are invariably in, or in front of, the eye-tangent, *Antargidium* can be separated by the short pedicellum which in *Caloptilia* is longer than broad, and also by the pronotal furrow which is not developed in *Caloptilia*, and the small apical cells to all wings. I should say also that the pronotal furrow is absent or partially absent in certain species of *Arge*.

Key to Species.

1. Wings infuscate throughout; recurrent vein in hind-wing either interstitial with cubital vein or else nearer to apex of wing (figs. 2 and 3); face clearly punctured; supraclypeal area with a longitudinal median carina in the hind part; ♀ hypopygium entire behind.

   Wings infuscate at apex only; recurrent vein in hind-wing nearer to base of wing than cubital (fig. 1); face unpunctured; hind part of supraclypeal area without a median longitudinal carina; ♀ hypopygium sharply excised in the middle of the hind margin.

   [♂ unknown. Head, pronotum and middle segments of abdomen yellow; hind basitarsus equals in length the three following tarsal segments together; sawsheath (fig. 4, *a* and *b*)] . . . . Queensland, *allucente*, sp. n.

2. Abdomen all yellow; pronotum black in ♂, yellow in ♀; in hind-wing recurrent vein interstitial with cubital vein (fig. 2); hind basitarsus is equal in length to three following tarsal segments together; ♀ sawsheath (figs. 5*a* and *b*) . . . . . Queensland, *dentivalvis*, sp. n.

   Abdomen black at apex; pronotum black in ♂ and ♀; in hind-wing recurrent vein is nearer to apex of wing than cubital vein (fig. 3); hind basitarsus is longer than the three following tarsal segments together; ♀ sawsheath (fig. 6*a* and *b*) . . . . . Queensland, *apicale*, W. F. Kirby.

Antargidium allucente, sp. n.

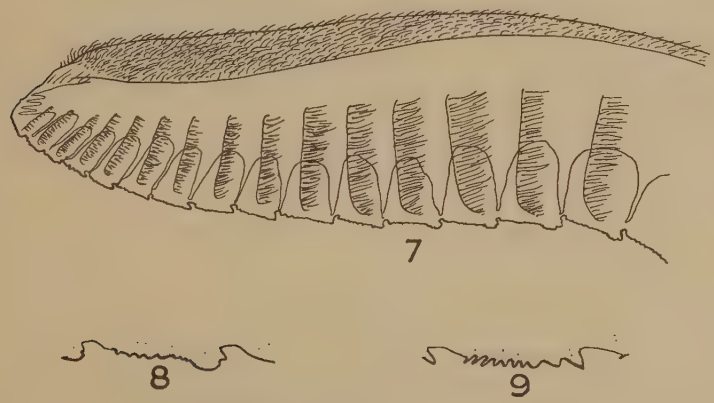
♀. *Colour*: head yellow, slightly rufescent on the temples; the antennae and the ocellar region black; thorax and abdomen yellow except for the mesopleurae which are brownish behind, and for the following which are black: meso- and metanotum, apex of tergum 5 in the middle, middle of tergum 6, whole of tergum 7, sternum 7 in the middle,

and the apical segments entirely. *Legs*: fuscous, but more or less yellow are the coxae, trochanters, apex of femur, inner side of tibiae and tarsi of front and middle legs, and a line on the outer side of hind tibia. *Wings*: hyaline at base, slightly infuscate in the apical half; stigma and venation fuscous except for the costa basally which is yellow like the tegulae. *Length*: 6 mm.; fore-wing 5·5 mm.; antenna 1·7 mm. *Puncturation* entirely absent from the surface which is very smooth and shining. *Head*: with supraclypeal area simply rounded, not carinate in the middle behind. *Legs*: hind basitarsus about as long as the three following tarsal segments together. *Wings*: recurrent vein in the hind-wing nearer to the base of the wing than the cubital so that the discoidal cell is smaller and shorter than the cubital cell as in *Arge* (fig. 1). *Abdomen*: hind margin of hypopygium deeply excised in the middle; sawsheath with a small dorsal tooth to each valve (figs. 4*a* and *b*); saw (figs. 7 and 8).

Queensland: near Springsure, Meteor Downs, 2 ♀♀, 18 Nov.–3 Dec. 1930 (*I. M. Mackerras*). Holotype in the museum at Canberra, paratype in the British Museum.

Antargidium dentivalvis, sp. n.

♀. *Colour*: head yellow except for the vertex and the flagellum of the antennae which are black; thorax black except for the pronotum, tegula and more or less the front and sides of the front lobe of the mesonotum which are yellow; legs yellow except the middle and hind coxae, and all the femora which are black as well as the slightly infuscate front side



Figs. 7–9.—Saws of *Antargidium*, 7, *A. allucente*, sp. n.; 8, tenth tooth of *A. allucente*, sp. n.; 9, tenth tooth of *A. dentivalvis*, sp. n.

of the fore-legs and the apex of hind tibia and tarsi; abdomen all yellow including the sawsheath. *Wings*: infuscate throughout; stigma and venation fuscous yellow. *Length*: 4 mm.; fore-wing 3·5 mm.; antenna 1·5 mm. *Puncturation*: face is clearly punctured with regular round punctures; rest of insect is unpunctured and shining. *Head*: with supraclypeal area carinate in the middle of the hind part. *Legs*: hind basitarsus about as long as the following three tarsal segments together. *Wings*: recurrent vein in hind-wing interstitial with the cubital vein (fig. 2). *Abdomen*: hypopygium with hind margin not emarginate but entire; sawsheath with a very prominate dorsal tooth to each valve (figs. 5*a* and *b*); saw very similar to that of *A. allucente*, sp. n. (fig. 7), but the denticulations to the teeth are stronger and the hair-bands are narrower; the tenth tooth is illustrated in fig. 9.*

* The saw of *A. apicale*, W. F. Kirby, is almost identical with the saw of *A. dentivalvis*, sp. n., but the teeth are set further apart.

♂. *Colour*: Head (except for the brownish labrum, clypeus and supraclypeal area) and thorax all black; legs with coxae, trochanters and femora black, otherwise dirty white becoming fuscous on tarsi and outside of hind tibia. Wings infuscate throughout. *Length*: 3·5 mm.; fore-wing 3·5 mm.; antenna 2 mm.

In structure as in ♀ except for genital segments.

Queensland: Townsville, 1 ♀ (holotype), 1 ♂ (allotype), 4.xi.1903 (*F. P. Dodd*). R. E. Turner coll., British Museum 1910–225.

ZUR KENNTNIS DER PALÄARKTISCHEN HARPALINEN (COL.) *

Von Dr. E. Schauberger.

(*Vöcklabruck, Oberösterreich.*)

Proditomus, gen. n.

Die neue Gattung ist der Gattung *Ditomus*, Bon., sehr ähnlich und stimmt mit ihr auch in der Form des Submentums überein. Die Oberseite ist ziemlich stark gewölbt; der Kopf mit den Augen ist nicht schmäler als der Halsschild, der Hals nicht abgeschnürt, etwas breiter als die Stirn zwischen den Augen, mit dem Kopf gleichmässig gewölbt; der Halsschild ist stark quer, am Vorderrand in gleichmässigem, aber schwachem Bogen ausgeschnitten, die Vorderecken sind schmal zugespitzt und mässig vorgezogen, liegen aber nicht ganz am Kopf an, sondern stehen etwas von ihm ab; die durch eine tiefe Ausschweifung abgesetzte Basalpartie ist ziemlich lang und schmal und parallelseitig. Das Submentum ist ziemlich kurz, seine distalen Ecken sind ziemlich breit abgerundet und die bogenförmige Querkante entspringt ausserhalb der distalen Ecken und trennt einen verhältnismässig breiten Spitzenteil ab, der Kinnzahn ist gross und kräftig. Neben den Augen befindet sich nur ein Supraorbitalpunkt.

Von der Gattung *Ditomus* unterscheidet sich die neue Gattung aber wesentlich durch den tief ausgeschnittenen Vorderrand von Oberlippe und Clypeus, durch die Form der Glossa, die abgekürzte Seitenrandung von Halsschild und Flügeldecken und die Beborstung der Vorderschienen. Die Oberlippe erscheint infolge des tiefen, rundlichen Ausschnittes stark zweilappig; der Clypeus ist in tiefem Bogen ausgeschnitten und bildet stärker vorragende, aber ziemlich breit abgerundete Vorderecken. Die Glossa ist länglich-dreieckig, mit schmal abgerundeter Spitze und ist innen mit zahlreichen Drüsenhaaren besetzt; die Paraglossen sind äusserst kurz und undeutlich, chitinös. Die Seiten des Halsschildes sind im vorderen Fünftel nur kräftig gekantet, ohne deutliche Randkehlung, von da ab bis etwas hinter die Mitte ist sowohl ein Randwulst, wie auch eine seichte Randkehlung ausgebildet, vom Beginne der Ausschweifung an bis zu den Hinterecken sind die Seiten aber vollkommen ungerandet, nicht einmal deutlich gekantet; in diesem Merkmale ähnelt die neue Gattung sehr der Gattung *Carenochyrus*, Sols., bei der in der hinteren Hälfte die Seitenrandung des Halsschildes ebenfalls erloschen ist. Auch die Seitenrandung der Flügeldecken ist abgekürzt, sie reicht nur bis zum Beginne des 7. Streifens und erlischt dort vollständig, die Flügeldeckenbasis ist infolgedessen vollkommen ungerandet. Der untere Apikalrand der Vorderschienen ist mit einer dichten Reihe gleichmässiger Borsten besetzt, welche die Aussenecke etwas umfasst und den Übergang von der Vorderschienenbewehrung von *Machozetus*, Chd., zu der von *Ditomus* bildet; vor dem Beginne des Innenrandausschnittes stehen drei lange S-förmige Borsten.

Genus type: *P. mirus*, sp. n.

* Sechzehnter Beitrag.

Die Gattung fügt sich in folgender Weise in die von mir im 14. Beitrag zur Kenntnis der paläarktischen Harpalinen (1934, Koleopt. Runds. 20) gegebenen Tabelle der Gattungen der Subtribus Ditomini ein:

13(2). Submentum mit grossem und kräftigem Kinnzahn, der nur wenig kürzer ist als die Seitenlappen; die Seitenlappen vorne breit abgerundet oder abgestumpft, die bogenförmige Querkante entspringt ausserhalb dieser abgerundeten oder abgestumpften Ecken und trennt einen breiten und flach liegenden Spitzenteil ab. Glossa an der Basis breit, kurz oder mässig lang, seitlich manchmal stark erweitert, die Paraglossen kahl oder undeutlich behaart, meist kürzer als die Glossa, seltener so lang oder länger als diese, dann aber sehr schmal. Kopf in der Halspartie stark verdickt, der Hals nicht abgeschnürt, mit dem Kopf gleichmässig stark gewölbt mindestens so breit als die Stirn zwischen den Augen. Halsschild sehr stark quer, die Vorderecken mehr oder weniger stark spitzwinkelig vorgezogen, zugespitzt oder am Ende nur sehr schmal abgestumpft, sie umfassen meist den Kopf bis zu den Schläfen; die Basalpartie stark abgesetzt, schmal, parallelseitig oder nach hinten divergierend. Episternen der Hinterbrust mässig lang bis lang.

13*a*(13*b*). Clypeus in der Mitte des Vorderrandes in tiefem Bogen ausgeschnitten. Oberlippe vorne mit sehr tiefem, rundlichem Ausschnitt, zweilappig. Glossa länglich-dreieckig, mit schmal abgerundeter Spitze. Halsschildseiten in der hinteren Hälfte vollständig ungerandet. Die Seitenrandung der Flügeldecken endet am Beginne des 7. Streifens, die Basis ist vollständig ungerandet . . . . *Proditomus*, gen. n.

13*b*(13*a*). Clypeus am Vorderrand gerade abgeschnitten oder nur in schwachem Bogen ausgeschnitten. Oberlippe vorne gerade abgeschnitten oder seicht eingebuchtet, nicht zweilappig. Glossa trapezoidal, vorne breit abgerundet oder seicht eingebuchtet. Halsschildseiten bis zu den Hinterecken vollständig gerandet. Die Seitenrandung der Flügeldecken umfasst die Schultern und setzt sich in eine bis nahe an den Mesosternalstiel reichende Basalrandung fort

Ditomus, Bon.

Proditomus mirus, sp. n.

Körper einschliesslich der Fühler, Taster und Beine pechschwarz, nur die Spitzen der Tasterendglieder rötlich. Körper robust, oberseits stark gewölbt. Der Kopf sehr gross, mit den Augen so breit als der Halsschild in seiner grössten Breite, gewölbt; die Augen verhältnismässig klein, so lang als das erste Fühlerglied, mässig gewölbt, die Schläfen lang, flach gewölbt, allmählich in den dicken Hals übergehend; die Stirngruben kurz strichförmig, nicht vertieft; die Oberseite mit tiefen, mässig groben Punkten ziemlich weitläufig besetzt. Der Halsschild stark quer, an der Basis nur halb so breit als vorne, am Vorderrand in seichtem, gleichmässigem Bogen ausgeschnitten; die Vorderecken spitzwinkelig, schmal zugespitzt, etwas vorgezogen; die Seiten sind von der grössten Halsschildbreite im vorderen Drittel an nach vorne fast geradlinig und schwach verengt, etwas hinter der Mitte biegen sie in kräftigem Bogen nach innen und bilden eine sehr tiefe Ausschweifung, die Basalpartie ist ziemlich lang (sie nimmt fast ein Fünftel der Gesamtlänge des Halsschildes ein) und parallelseitig; die Seitenrandung ist nur vom vorderen Fünftel an bis zum Beginne der tiefen Ausschweifung etwas hinter der Mitte deutlich, vorne undeutlich, in der hinteren Hälfte aber fehlt sie vollkommen; die Hinterecken sind scharf rechtwinkelig; die Basis ist in schwachem Bogen ausgeschnitten, ungerandet, die Basalpartie deutlich von der Scheibe abgesenkt und zeigt seitlich neben dem Seitenrand kleine, wenig deutliche Basaleindrücke; die Oberseite ist wie der Kopf mit tiefen, mässig groben Punkten ziemlich

weitläufig besetzt. Das Prosternum ist zur Gänze sehr grob und gedrängt punktiert. Die Flügeldecken sind kurz eiförmig, hoch gewölbt, ziemlich stark glänzend, die Schultern sind etwas abgeschrägt und breit abgerundet, der Seitenrand endet an der Schulter am Beginne des 7. Streifens, eine Basalrandung ist nicht vorhanden, ein deutlicher Ausschnitt vor der Spitze fehlt; die Streifen sind ziemlich fein, im basalen Drittel ziemlich grob punktiert, nach hinten nimmt die Punktierung an Stärke sehr ab und ist gegen die Spitze nur wenig deutlich, der Skutellarstreifen ist mässig lang, vertieft; die Zwischenräume sind eben, fast einreihig punktiert, die Punkte sind sehr fein, fast erloschen und sehr weitläufig und unregelmässig angeordnet. Die häutigen Flügel sind zwar ziemlich lang, aber schmal und nicht zusammengefaltet, flugunfähig. Die Episternen der Hinterbrust mässig lang, ungefähr $1\frac{1}{3}$ mal so lang als vorne breit und nach hinten ziemlich stark verschmälert, wie der übrige Teil der Mittel- und Hinterbrust grob und gedrängt punktiert. Die Abdominalsegmente fein und gedrängt punktiert.—Länge 14·5 mm.

TURKESTAN; 1 ♀ in meiner Sammlung.

Tschitscherinellus cordatus, Dej., **fortepunctatus**, subsp. n.

Von Ficuzza in Sizilien liegt mir ein ♂ vor, das sich vom typischen mediterranen *cordatus*, Dej., sehr auffällig durch die gröbere und gedrängtere, drei- bis unregelmässig vierreihige Punktierung der Flügeldeckenzwischenräume unterscheidet. Die Punkte auch der inneren Zwischenräume sind nicht wie beim typischen *cordatus* seicht oder erloschen, sondern deutlich vertieft. Die Flügeldecken sind fast noch schlanker als bei der Nominatform und die Hinterecken des Halsschildes sind nicht schwach spitzwinkelig, sondern ziemlich scharf rechtwinkelig und die Basis ist seitlich kaum abgeschrägt.—Länge 18 mm.

Auf Sizilien kommt auch die Nominatform vor.

Tschitscherinellus cordatus, Dej., **minos,** subsp. n.

Von Assitaes auf Creta (leg. Holtz) liegt mir ein ♂ vor, das sich vom typischen *cordatus*, Dej., durch die rechtwinkeligen Hinterecken des Halsschildes, die etwas breiteren und kürzeren Flügeldecken und die kräftigeren und tiefer eingedrückten und viel gröber punktierten Streifen derselben deutlich unterscheidet. Die Zwischenräume der Flügeldecken sind gewölbter, ihre Punktierung ist aber nur seicht bis auf die Punkte, die in den Reihen der abwechselnden Zwischenräume stehen und ebenso kräftig sind wie die Punkte in den Streifen. Die Beine sind rostrot.—Länge 17·5 mm.

Pseudaristus, Reitter.

Aus dem Genus *Pseudaristus* liegen mir zwei Arten vor, die sich von einander in der Stärke des Glanzes, der Dichte der Punktierung und der Länge der Behaarung der Oberseite und in der Halsschildform deutlich unterscheiden.

Die eine Art die mir in einem ♂ von Beirut, dem typischen Fundort des *modestus*, Schaum, vorliegt, ist auch mit diesem zu identifizieren. Bei ihr ist die Oberseite stark glänzend und nicht deutlich chagriniert, nur mässig fein und mässig dicht punktiert, der Halsschild ist am Vorderrand nur sehr schwach ausgeschnitten, vor den Hinterecken mässig stark ausgeschweift, seine Seiten sind vor der Ausschweifung nur verhältnismässig schwach gerundet, die Hinterecken scharf rechtwinkelig und die Basis ist seitlich nicht abgeschrägt, die Flügeldeckenzwischenräume sind verhältnismässig grob, zweireihig punktiert und mässig kurz, abstehend behaart. Die Taster, Fühler und Beine sind

rötlichbraun. Die Länge dieses Stückes beträgt 6 mm. Dass diese Art als der echte *modestus*, Schaum, anzusprechen ist, glaube ich ohne weiteres aus den Worten der Beschreibung (1858, Wien. ent. Monats., **2** : 275) : " ziemlich stark glänzend," der " Halsschild . . . vorne schwach ausgerandet, mit etwas vorstehenden Vorderecken, an den Seiten schwach gerundet, nach hinten verengt, aber nur unmittelbar vor den kleinen rechtwinkeligen Hinterecken ein wenig ausgeschweift," " die Zwischenräume [der Flügeldecken] deutlich und nicht sehr dicht punktiert. Die Punkte ordnen sich fast in zwei Reihen " ableiten zu können. Mit *modestus* ist der von Coye nach Stücken von Kab-Elias beschriebene *Aristus elegans* (1869, L'Abeille, **6** : 369) sicherlich artgleich.

Die zweite Art, die mir in drei Stücken aus Syrien : ohne nähere Fundortsangabe, von Saida und von Haifa vorliegt, ist auf der Oberseite nur sehr schwach glänzend, fast matt, stark chagriniert, die Punktierung ist etwas feiner und dichter, der Halsschild ist am Vorderrand zwar seicht, aber viel deutlicher ausgeschnitten, vor den Hinterecken etwas tiefer ausgeschweift und seine Seiten sind vor der Ausschweifung viel stärker gerundet, die Hinterecken etwas mehr stumpfwinkelig und die Basis ist seitlich mehr oder weniger stark abgeschrägt, die Flügeldeckenzwischenräume sind etwas feiner und etwas dichter punktiert und äusserst kurz (nur halb so lang als bei *modestus*) abstehend behaart. Die Färbung der Taster, Fühler und Beine ist dunkler, pechbraun bis pechschwarz. Die Länge schwankt zwischen 6 und 9 mm. Auf diese Art beziehe ich den von Baudi (1894, Boll. Mus. Zool. Anat. comp., **9** : 2) nach Stücken von Jerusalem und Djerach beschriebenen *Ditomus* (*Aristus*) *punctatissimus*, von dem unter anderem gesagt wird : " capite thorace dense, subtiliter, elytris crebre irregulariterque punctatis . . . thoracis margo anticus late leniter emarginatus, angulis anticis subrectis. . . . Appena della statura dei più piccoli *sphaerocephalus*," und der infolgedessen eine gute Art und kein Synonym des *P. modestus*, Schaum darstellt.

Die tabellenmässige Zusammenstellung der Unterschiede der beiden Arten ist folgende :

1(2). Oberseite matter, stark chagriniert, die Punktierung feiner und gedrängter, auf den Flügeldecken unregelmässig 3–4reihig, die abstehende Behaarung äusserst kurz. Halsschild am Vorderrand seicht ausgeschnitten, die Seiten vor den Hinterecken ziemlich tief ausgeschweift und vor der Ausschweifung ziemlich stark gerundet, die Hinterecken scharf, aber etwas mehr stumpfwinkelig, die Basis seitlich mehr oder weniger stark abgeschrägt.—Länge 6–9 mm.—Syrien, Palästina *punctatissimus*, Baudi.

2(1). Oberseite stark glänzend, ohne deutliche Chagrinierung, die Punktierung nur mässig fein und weniger dicht, auf den Flügeldecken etwas gröber und zweireihig, die abstehende Behaarung mässig kurz. Halsschild am Vorderrand nur sehr schwach ausgeschnitten, die Seiten vor den Hinterecken mässig stark ausgeschweift und vor der Ausschweifung verhältnismässig schwach gerundet, die Hinterecken scharf rechtwinkelig, die Basis seitlich nicht abgeschrägt.—Länge 6 mm.—Syrien (? *minutus*, Stichel, *elegans*, Coye) *modestus*, Schaum.

In der 1923, Z. wiss. InsBiol., **18** : 50, beschreibt Stichel einen *P. minutus* mit folgenden Worten : " Aus Beirut (Syrien) liegen mir zwei Tiere vor, die *P. modestus*, Schaum, sehr nahe stehen. Die Punktierung des Körpers ist viel feiner als bei *modestus*, die Seitenränder des Halsschildes sind nicht so

scharf gebogen wie bei diesem. Die Fühler sind rotbraun und sehr fein weiss behaart, die Beine sind schwarzbraun. Länge 6 mm." Nach diesen Angaben über die Halsschildform, die Fühlerfärbung und den Fundort zu schliessen, gehören die beiden als *minutus* beschriebenen Stücke mit grosser Wahrscheinlichkeit zu *modestus*, Schaum, und zwar dürften es ♀♀ sein, bei welchen die Punktierung der Oberseite stets feiner ist als bei den ♂♂. Leider sagt die mehr als dürftige Beschreibung nichts über andere Merkmale, vor allem nichts über die Mikroskulptur, die Dichte der Punktierung und die Länge der Behaarung, sowie über die Form der Hinterecken. Was den *P. modestus* selbst anlangt, so hat ihn Stichel nicht richtig erkannt, denn sonst wäre es nicht möglich gewesen, dass er *loc. cit.*, **18** : 100, für *modestus* auch die Fundorte anführte, die mit Bestimmtheit nicht auf diese Art, sondern auf den verwandten, aber deutlich verschiedenen *punctatissimus*, Baudi zu beziehen sind, obwohl er zum Teil wenigstens die Möglichkeit hatte, das Fundortsmaterial genau zu untersuchen.

Harpalus (s.str.) **indicola,** Bates, **finitimus,** subsp. n.

In der 1933, Wien. ent. Ztg., **50** : 71, gab ich an, dass der *H. indicola*, Bates, auch in der südwestchinesischen Landschaft Yunnan : Tal des Flusses Soling-ho und Mengtze vorkomme. Mir lagen damals von jedem der beiden Fundorte je ein ♀ vor. Herr Ing. Jedlička in Prag sandte mir nunmehr ein drittes Stück (♀) aus der Provinz Szetschuan : Tatsienlu—Kiulung (coll. Reitter) zur Untersuchung, das mit den beiden ersten übereinstimmt. Diese drei Stücke zeigen gegenüber dem typischen *indicola*, Bates konstante Unterschiede, so dass sie zum mindesten als Vertreter einer besonderen Rasse, welche ich subsp. *finitimus* nenne, angesehen werden müssen (leider liegen mir nur ♀♀ vor, so dass ich die Penisform nicht untersuchen und mit der des typischen *indicola* vergleichen kann). Die Unterschiede sind folgende : die neue Form ist etwas gestreckter und flacher als die Nominatform, der Halsschild ist deutlich weniger stark gewölbt, er fällt seitlich weniger stark ab, seine Seitenrandkehlung ist deutlich breiter rinnenartig, der Zwischenraum zwischen den ziemlich tiefen, länglichen Basalgruben ist schwächer gewölbt und die Punktierung der Basalpartie ist etwas ausgedehnter, weniger grob und gedrängter und die Flügeldecken sind hinten etwas stärker zugespitzt und besitzen nur ein äusserst kleines, kaum deutliches Schulterzähnchen.—Länge 8·5–9 mm.

Harpalus (s.str.) **praecurrens,** sp. n.

Geflügelt. Körper pechschwarz, nur die Seitenränder des Halsschildes sehr schmal rötlich durchscheinend, die umgeschlagenen Seiten der Flügeldecken dunkel, die Fühler, Taster und Beine rötlichgelb. Beim ♂ ist die Oberseite ziemlich stark glänzend, der Kopf und die Scheibe des Halsschildes sind ohne mikroskopische Netzung, die Flügeldecken nur seitlich und vor der Spitze deutlich isodiametrisch genetzt, auf der Scheibe ist die Netzung erloschen; beim ♀ ist der Kopf, die Halsschildscheibe und der mittlere Teil der Flügeldecken schwach glänzend und nur die Basalpartie und die Seiten des Halsschildes und die Seiten und der hintere Teil der Flügeldecken sind matter. Der Kopf ist mässig gross, nicht verdickt, die Augen sind ziemlich stark gewölbt, die Schläfen ziemlich lang und fallen schräg zum Hals ein, die Stirngruben sind klein, punktförmig. Der Halsschild ist mässig stark quer, nach vorne in mässigem Bogen, nach hinten nicht oder kaum verengt, die Seiten sind vor den Hinterecken geradlinig, der Vorderrand ist in schwachem Bogen ausgeschnitten; die Vorderecken sind ziemlich breit abgerundet, die Hinterecken rechtwinkelig und schmal abgerundet; die Basis ist fast gerade, die Basalrandung ist in der Mitte deutlich unterbrochen, die Basalgruben sind länglich und mässig tief, die Basalpartie ist bis auf die nur

vereinzelt punktierte Mitte mässig fein und ziemlich dicht, in den Basalgruben fast runzelig zusammenfliessend punktiert. Die Flügeldecken sind länglich-elliptisch, zur Basis in schwachem Bogen verengt, die Basalkante ist seitlich mässig nach vorne gebogen, sie trifft mit dem Seitenrand in deutlichem stumpfen Winkel zusammen und bildet ein deutliches, scharfes Schulterzähnchen, der Ausschnitt vor der Spitze ist ziemlich tief; die Streifen sind mässig fein, glatt, nach hinten kaum stärker vertieft, die Zwischenräume leicht gewölbt, der 3. mit einem groben eingestochenen Punkt im hinteren Drittel, der 7. vor der Spitze ohne Punktreihe. Die Episternen der Hinterbrust sind mässig lang, $1\frac{1}{3}$ mal so lang als vorne breit und nach hinten mässig stark verengt. Die letzten Abdominalsegmente sind unpunktiert und kahl, das Analsegment des ♂ besitzt zwei Borstenpunkte jederseits. Vorderschienen am Aussenrand mit 4–5 Dörnchen, Hinterschenkel am Hinterrand mit 4 Borstenpunkten. Der Apikalteil des Penis ist mässig lang, bis gegen das seitlich schwach vorspringende, kurz-dreieckige, an der Basis tief ausgeschnittene, vorne abgerundete Scheibchen parallelseitig; im Profil gesehen, ist das Scheibchen schwach schräg nach innen gerichtet.—Länge 7·5–8 mm.

Szetschuan: Giufushan (ex. coll. Reitter), 1 ♂ [Type]; Tatsienlu-Tjiji (ex coll. Reitter), 1 ♂; Kwanshien (ex coll. Hauser), 1 ♀.

Die neue Art ist dem *H. winkleri*, Schaub., sehr ähnlich und unterscheidet sich von ihm in der Hauptsache durch die unvollständige Basalrandung des Halsschildes, den tieferen Ausschnitt der Flügeldecken vor der Spitze, die grössere Zahl der Dörnchen am Aussenrand der Vorderschienen und die Penisform.

Harpalus (s.str.) **adventicius**, sp. n.

Aus Szetschuan: Mts. Yunling (ex. coll. Hauser) liegen mir 1 ♂ und 2 ♀♀ einer Form vor, die dem *H. praecurrens*, m. sehr ähnlich ist und mit ihm im besonderen im ziemlich starken Glanz und in der reduzierten Mikroskulptur der Körperoberseite des ♂, in der Form von Halsschild und Flügeldecken, der Bildung der Schultern, dem tiefen Ausschnitt vor der Flügeldeckenspitze, der Zahl der Dörnchen am Aussenrand der Vorderschienen und der Körpergrösse übereinstimmt, sich aber von ihm durch die nur vorne dunkeln, in der hintern Hälfte rötlichen umgeschlagenen Seiten der Flügeldecken, die vollständige Basalrandung des Halsschildes und die ein wenig verschiedene Penisform unterscheidet. Das Scheibchen des Penis ist nur mässig kurz dreieckig, an der Basis nur seicht ausgeschnitten, vorne ziemlich breit abgerundet und im Profil gesehen, nur sehr schwach schräg nach innen gerichtet. Trotz der verhältnismässig geringen Verschiedenheiten neige ich eher dazu, den *H. adventicius* für eine selbständige Art zu halten, als ihn als eine blosse Lokalform des *H. praecurrens* anzusprechen.

Dem *H. winkleri*, Schaub., gegenüber ist er durch den tieferen Ausschnitt der Flügeldecken vor der Spitze, die grössere Zahl der Dörnchen am Aussenrand der Vorderschienen und die Penisform gekennzeichnet.

Harpalus (s.str.) *alluaudi*, Ant.

Von dieser Art liegt mir auch ein ♂ von Tunis: Hammam-Lif (leg. Dr. Normand) vor, von geringfügigen Unterschieden in der Form des Apikalteils des Penis abgesehen, kann ich keine Verschiedenheiten gegenüber den marokkanischen Stücken dieser Art bemerken.

Im 1926, Coleopt. Bl. **1** : 35, habe ich gesagt, dass *alluaudi* infolge des schlankeren Körpers und der längeren und schlankeren Fühler und Taster dem *rufitarsis*, Duft., und vor allem der Rasse *decipiens*, Dej., näher steht als dem *neglectus*, Serv., und habe ihn auch im Katalog nach *decipiens* eingereiht.

Ich habe jetzt aber feststellen können, dass sowohl bei *neglectus*, wie auch bei *alluaudi* am erweiterten inneren Teil der Hinterhüften ausser dem normalen Borstenpunkt noch eine Gruppe einiger weiterer Haare tragender Punkte vorhanden ist, die den übrigen Arten der *rufitarsis*-Verwandtschaft fehlt, so dass *alluaudi* eine Mittelstellung zwischen *neglectus* und den übrigen Arten der *rufitarsis*-Verwandtschaft einnimmt. Die Tatsache, dass *neglectus* und *alluaudi* verschiedene selbständige Arten sind, wird durch diese Feststellung in keiner Weise berührt. Als weitere Unterschiede dem *neglectus* gegenüber sind noch die stärkere Wölbung der Körperoberseite und der deutlich anders geformte Apikalteil des Penis anzugeben.

Während ich von *alluaudi* bisher nur ungeflügelte Stücke gesehen habe, kommt *neglectus* sowohl in einer "forma aptera," wie auch in einer "forma alata" vor, von welchen erstere wenigstens in Südeuropa und stellenweise auch in Mitteleuropa zu überwiegen scheint.

Harpalus (s.str.) **sulphuripes,** Germ., **lucidipennis,** subsp. n.

Mit der Bezeichnung: Marocco (Fr. Wiengreen) liegt mir ein ♂ des *H. sulphuripes*, Germ. vor, das sich durch stark glänzende Flügeldecken auszeichnet. Während beim typischen *sulphuripes* die Flügeldecken des ♂ schon bei 35facher Lupenvergrösserung grob genetzt erscheinen, ist bei der Rasse bei dieser Vergrösserung auf der Flügeldeckenscheibe noch keine Netzung sichtbar, erst bei stärkerer Vergrösserung sind feine Netzmaschen festzustellen. Im starken Glanz der Flügeldecken ähnelt die neue *sulphuripes*-Rasse sehr dem *H. goudoti*, Dej., unterscheidet sich aber von ihm durch bedeutendere Grösse, die nicht rein schwarze, sondern etwas ins Violette gehende Färbung der Oberseite, die schwarzen Schenkel und Enden der Schienen, die etwas längeren, nach hinten etwas stärker verengten, im hinteren Teile fast parallelseitig verlaufenden Episternen der Hinterbrust und den im Profil etwas gestreckter erscheinenden Apikalteil des Penis.

Harpalus (s.str.) *dissitus*, Ant.

Von seinem im 1931, Bull. Soc. Sci. nat. Maroc, **11** : 20, beschriebenen *H. rufitarsis* var. an ssp. *dissitus* überliess mir Herr Antoine in liebenswürdigster Weise mehrere Stücke mit den Fundortsangaben: Tachdirt, Arround, Lac Sidi Ali, Lac d'Ifni, Tizi n'Teluet, Dj. Aouldjdid und Haut Acif Azourei, zur Untersuchung, wofür ich ihm auch an dieser Stelle herzlichst danke. Die Untersuchung dieser Stücke ergab, dass *dissitus* von *rufitarsis*, Duft., und der subsp. *decipiens*, Dej., so sehr verschieden ist, dass er nicht mehr als Rasse des *rufitarsis*, sondern nur als selbständige Art angesehen werden kann. In der breiten, gedrungenen Körperform ähnelt *dissitus*, wie Antoine mit Recht bemerkt, der subsp. *decipiens*, doch ist der Halsschild besonders in der Nähe der Vorderecken stärker gewölbt und an den Seiten vor den Hinterecken deutlich etwas ausgeschweift und die Episternen der Hinterbrust sind noch etwas kürzer. Ausserdem unterscheidet er sich sowohl von *rufitarsis*, wie auch von *decipiens* durch das vollständige Fehlen häutiger Flügel, das Nichtvorhandensein der Punktreihe vor der Spitze des 7. Flügeldeckenzwischenraums und die Penisform. Bei *rufitarsis* und *decipiens* ist der Apikalteil des Penis zwar ziemlich lang, gegen das dreieckige Scheibchen aber nur verhältnismässig schwach erweitert und, im Profil gesehen, deutlich nach innen gebogen, das Scheibchen im Profil schwach schräg angesetzt, an seiner Basis in einem scharfen spitzen Winkel nach aussen tretend und an seinem Aussenrand nur schwach gebogen; bei *dissitus* dagegen ist der Apikalteil in seinem Beginne viel schmäler, gegen die Basis des viel kürzer dreieckigen Scheibchens auf das

Doppelte seiner geringsten Breite erweitert und, im Profil gesehen, fast ganz gerade, und das Scheibchen tritt im Profil, ähnlich wie bei *honestus*, an der Basis nur schwach und nur in einem abgerundeten, stumpfen Winkel nach aussen und ist an seinem Aussenrand in einem gleichmässigen, aber starken Bogen nach innen gekrümmt.

Harpalus (s.str.) **rufitarsoides**, sp. n.

Von dieser interessanten neuen Art übersandte mir Herr Antoine zwei aus Marocco stammende ♂♂ mit der Fundortsbezeichnung: "Azrou, moyen Atlas, 1600m." Sie steht dem *H. rufitarsis*, Duft., sehr nahe, unterscheidet sich aber von ihm im wesentlichen durch die etwas bedeutendere Grösse, die stärker glänzende Oberseite des ♂, die kurzen Episternen der Hinterbrust und die Penisform.

Geflügelt. Körper tief schwarz, Taster und Tarsen rotbraun, Fühler rostrot, vom zweiten Glied an angedunkelt; die Oberseite stark glänzend, die isodiametrische Netzung nur vor der Spitze und an den Seiten der Flügeldecken deutlich. Kopf mässig gross, Augen ziemlich stark gewölbt, die ziemlich kleinen, rundlichen Stirngrübchen mässig tief. Halsschild ziemlich breit, nach vorne etwas stärker als zur Basis verengt, die Seiten mässig stark gerundet erweitert, die grösste Breite wenig vor der Mitte; die Seiten gegen die Basis in schwacher Ausschweifung verlaufend, die Hinterecken rechtwinkelig und ziemlich scharf; der Vorderrand in mässigem Bogen ausgeschnitten, die vollständig gerandete Basis fast gerade; die länglichen Basalgruben sind ziemlich tief und im Grunde etwas punktiert, auch neben dem Seitenrand mit einigen Punkten. Flügeldecken länglich-oval, fast parallelseitig, ziemlich fein gestreift, die Streifen glatt, gegen die Spitze stärker vertieft; die Zwischenräume auf der Scheibe kaum gewölbt, der 3. im Spitzenviertel mit einem eingestochenen Punkt am 2. Streifen, der 7. mit einer kurzen Punktreihe vor der Spitze; der Nahtwinkel nur sehr schwach abgestumpft. Die Episternen der Hinterbrust sehr kurz, am äusseren Rande kaum länger als am Vorderrande breit und nach hinten wenig verschmälert. Die vorletzten Abdominalsegmente mit spärlichen groben, lange Haare tragenden Punkten besetzt. Der lange ziemlich schmale Apikalteil des Penis gegen das Ende etwas erweitert und in ein vorne breit abgerundetes Scheibchen endigend, das, im Profil gesehen, schräg angesetzt ist.—Länge 9·5–11 mm.

Die Type befindet sich in der Sammlung des Herrn Antoine in Casablanca, die Cotype in meiner Sammlung.

Harpalus (s.str.) *wohlberedti*, Emd. & Schaub.

Diese Art war in einer Sendung des Herrn Antoine in mehreren Stücken von Azrou in einem Stück von Ifrane enthalten. Die auffallende Beständigkeit der Artmerkmale bestätigt die schon (1932, Stylops, **1** : 255) festgestellte Artselbständigkeit.

Harpalus (s.str.) *bellieri*, Reiche.

In der typischen forma *apiceseriata* liegt mir diese Art jetzt auch von Ajaccio in Corsica vor, während ich die f. *apiceinseriata* (= *adaequans*, m.) von Italien: Rom und von Sardinien besitze.

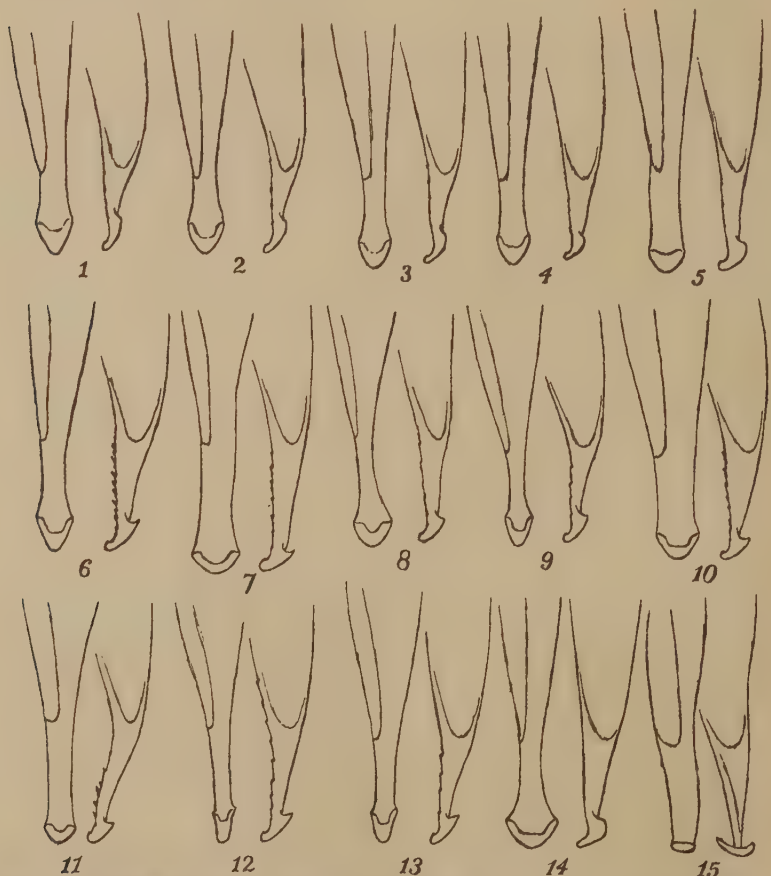
Harpalus (s.str.) *wagneri*, Schaub.

Diese Art kommt auch in einer forma *apiceinseriata* vor, welche mir sowohl von Zentralspanien: Escorial, wie auch von Südspanien: Sierra Nevada vorliegt.

Harpalus (s.str.) *nevadensis*, Dan.

Diese Art ist dem *H. bellieri*, Reiche, habituell am ähnlichsten. Der Körper ist ebenso gestreckt, aber etwas stärker gewölbt, der Halsschild zur Basis noch stärker verengt, vor den stumpfwinkeligen Hinterecken deutlich schwach ausgeschweift und die Episternen der Hinterbrust sind kurz, ähnlich wie bei *wagneri*, Schaub. Wesentlich verschieden von *bellieri* und *wagneri*, wie auch von *impressipennis*, Dej., ist die Form des Apikalteils des Penis: dieser ist mässig lang, zunächst sehr schmal, erweitert sich aber gegen die Spitze auf die doppelte Breite und schliesst mit einem breiten, dreieckigen, vorne abgerundeten Scheibchen, das, im Profil gesehen, schräg nach innen gerichtet ist. Die Art ist wie *wagneri* flügellos.

Von der Sierra Nevada liegt mit ausser dieser Art und dem *H. wagneri* auch *H. impressipennis*, Dej. vor.



Figs. 1–15.—Penisformen der Arten aus der Verwandtschaft des *Harpalus rufitarsis*, Duft. 1, *neglectus*, Serv.; 2, *alluaudi*, Ant.; 3, *sulphuripes*, Germ.; 4, *goudoti*, Dej.; 5, *honestus*, Duft.; 6, *rufitarsis*, Duft.; 7, *rufitarsoides*, sp. n.; 8, *dissitus*, Ant.; 9, *wohlberedti*, Emd. & Schaub.; 10, *wagneri*, Schaub.; 11, *bellieri*, Reiche; 12, *impressipennis*, Dej.; 13, *impr.* subsp. *latianus*, Schaub.; 14, *nevadensis*, Dan.; 15, *gisellae*, Csiki (= *errans*, Tschit.).

THE PROVENTRICULUS IN THE DYTISCIDAE (COL.) AS A TAXONOMIC CHARACTER

By Frank Balfour-Browne, M.A. (Oxon. et Cantab.), F.R.S.E., F.Z.S., F.R.E.S., P.R.M.S.

(*Formerly Professor of Entomology, Imperial College of Science, London.*)

Plates I to V.

The fore-gut of the insect ends posteriorly either in lobes bulging into the mid-gut and known as "oesophageal valves" or in a structure known as the proventriculus or gizzard, which is often armoured and muscular. The functions of this structure are threefold, since it controls the passage of the food into the mid-gut and it may act as a mill for crushing partly-digested food material or as a filter, allowing solid particles to pass from the oesophagus to the mid-gut but only allowing fluids to pass in the reverse direction. These fluids are digestive, so that part of the mid-gut digestion is carried out in the fore-gut. The proventriculus is furnished with hairs, mostly pointing towards the mid-gut, and various forms of chitinous knobs and "teeth," the latter also turned in the same direction as the majority of the hairs.

In the Dytiscidae, this structure consists of four main and four intermediate lobes, the latter overlapped by the former, and in some genera it is more or less tubular and strongly muscular. The lumen can thus be enlarged and contracted at the will of the insect and the muscular arrangement allows of something equivalent to a peristalsis, so that the grinding of the food material is accompanied by an onward movement of the solids. In other genera the structure is less tubular and more vase-like, the oesophageal end being more open than the mid-gut end (see pl. I, fig. 1 c), while in others again it is still more open and bowl-like (see pl. I, fig. 1 a and b). These descriptions are taken from the organ as it appears on dissection or after boiling in potash, that is, presumably, in a state of rest, but it is difficult to imagine that the bowl-like type of *Dytiscus*, *Cybister*, etc., can perform the same functions as the tubular type of *Hydroporus*, etc. Moreover, whereas the tubular form seems to be usually armed with large chitinous "teeth," the vase-like form has numerous spines while the bowl-like form has neither "teeth" nor spines.

However, the object of this paper is not to speculate on the different functions of this structure but to point out that the shape of the lobes varies so that different "patterns" are observable in different proventriculi, and that a pattern seems to remain constant as to its main details throughout a genus. Two or more genera may have the same pattern, but, so far, every genus examined has one definite pattern, excepting *Copelatus* which has two. In this case, of the 6 species examined, it is interesting to note that the subgenus *Liopterus* (2 spp.) has one pattern while the subgenus *Copelatus* has a widely different one, possibly suggesting that a more careful study of the whole genus might produce other evidence that these two subgenera are convergent groups and not related. How far a more extensive exploration of species will confirm these observations remains to be seen, but I have examined a hundred species and have found no exceptions. I have set out the list of species, arranging the genera under two headings according to the form of the proventriculus, of which there seem to be two fundamental types, that in which the main lobes are oval in shape and that in which they are triangular. I have, further, grouped the genera on other characters of the pattern, and it will be noted that there are no cases of related

genera being separated, while genera whose relationships are somewhat doubtful stand apart, e.g. *Pelobius*, *Noterus* and *Laccophilus*.

SPECIES EXAMINED.

Main Lobes of Proventriculus Oval.	Main Lobes of Proventriculus Triangular.
Noterus clavicornis, De G.	*Pelobius tardus*, Herbst.
,, *capricornis*, Herbst (*sparsus*, Marsh.)	*Laccophilus hyalinus*, De G. (*interruptus*, Panz.).
Hyphydrus ovatus, L.	,, *variolosus*, Herbst. (*obscurus*, Panz.).
,, *aubei*, Gangl. (Algeria).	*Agabus brunneus*, F.
Deronectes latus, Steph.	,, *didymus*, Ol.
,, *hispanicus*, Rosenh. (Spain).	,, *maderensis*, Woll. (Madeira).
,, 12-*pustulatus*, F.	,, *biguttatus*, Ol.
,, *canariensis*, Bedel (Grand Canary).	,, *melanarius*, Aubé.
,, *vigilans*, Woll. (Madeira).	,, *bipustulatus*, L.
,, *griseostriatus*, De G.	,, *wollastoni*, Sharp (Madeira).
,, *depressus*, F.	,, *subtilis*, Er. (Norway).
,, *elegans*, Panz.	,, *paludosus*, F.
,, *assimilis*, Payk.	,, *congener*, Thunb.
,, *clarki*, Woll. (Algeria).	,, *unguicularis*, Thoms.
,, *ceresyi*, Aubé (Spain).	,, *affinis*, Payk.
Oreodytes borealis, Gyll. (*davisi*, Curtis).	,, *nebulosus*, Forst.
,, *septentrionalis*, Gyll.	,, *conspersus*, Marsh.
,, *rivalis*, Gyll.	,, *sturmi*, Gyll.
,, *halensis*, F.	,, *arcticus*, Payk.
Hygrotus versicolor, Schall.	,, *zetterstedti*, Thoms. (Norway).
,, 5-*lineatus*, Zett.	,, *abbreviatus*, F.
,, *confluens*, F.	,, *femoralis*, Payk.
,, *impressopunctatus*, Schall.	*Platambus maculatus*, L.
,, *parallelogrammus*, Ahr.	*Ilybius fenestratus*, F.
Hydroporus pictus, F.	,, *fuliginosus*, F.
,, *lepidus*, Ol.	,, *subaeneus*, Er.
,, *dorsalis*, F.	,, *ater*, De G.
,, *lineatus*, F.	,, *obscurus*, Marsh.
,, *angustatus*, Sturm.	,, *aenescens*, Thoms.
,, *palustris*, L.	,, *angustior*, Gyll. (Norway).
,, *erythrocephalus*, L.	,, *guttiger*, Gyll.
,, *rufifrons*, Duftsch.	*Copelatus marginatus*, Sharp (Australia).
,, *gyllenhali*, Schiöd.	,, *pandanorum*, Scott (Seychelles).
,, *obscurus*, Sturm.	,, *gardineri*, Scott (,,).
,, *planus*, F.	,, ? (Jamaica).
,, *pubescens*, Gyll.	*Eretes sticticus*, L. (Algeria).
,, *nigrita*, F.	*Hydaticus seminiger*, De G.
,, *longulus*, Muls.	,, *transversalis*, Pont.
,, *memnonius*, Nic.	,, *leander*, Rossi (Spain).
Laccornis oblongus, Steph.	*Graphoderes cinereus*, L.
Copelatus agilis, F.	,, ? (Norway).
,, *atriceps*, Sharp (Corsica).	,, *occidentalis*, Horn (Canada).
Rhantus grapii, Gyll.	*Acilius sulcatus*, L.
,, *exoletus*, Forst.	,, *fasciatus*, De G.
,, *pulverosus*, Steph.	*Dytiscus punctulatus*, F.
,, *notatus*, F. (British and Canadian).	,, *marginalis*, L.
,, *binotatus*, Harr. (Canada).	,, *lapponicus*, Gyll.
,, *tostus*, J. Lec. (Canada).	,, *dimidiatus*, Bergstr.
,, *consimilis*, Motsch. (Canada).	*Cybister tripunctatus*, Ol. (Grand Canary).
,, *bistriatus*, Bergstr.	
,, *suturellus*, Harr. (Canada).	
Colymbetes fuscus, L.	
,, *paykulli*, Er. (Norway).	
Meladema coriacea, Cast. (Grand Canary).	
,, *lanio*, F. (Madeira).	

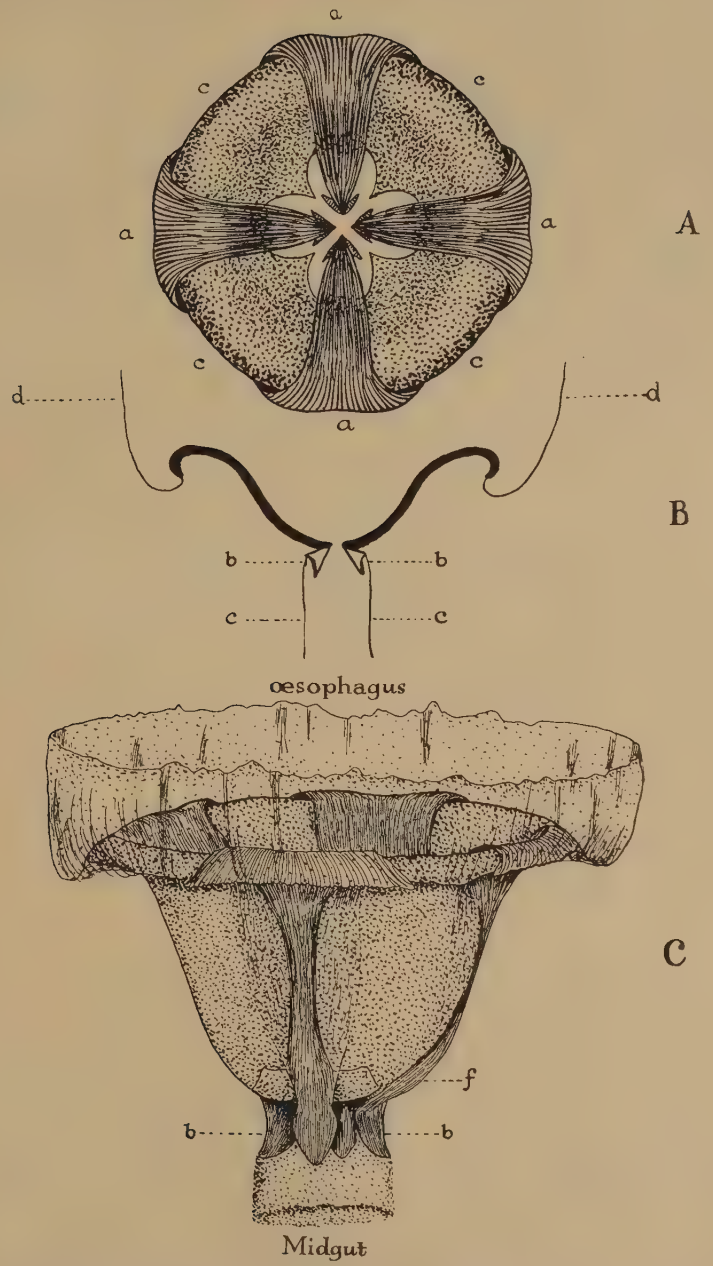
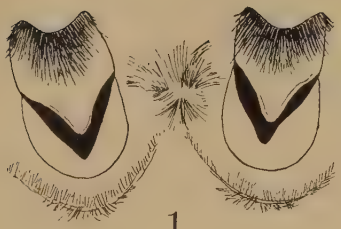


Fig. 1.—Diagrammatic representation of two types of proventriculus : A, the bowl-like type looked at from above, *i.e.* from the oesophageal opening. The main lobes (*a*) with their accessories actually meet in the middle, (*c*) the intermediate lobes. B shows a median longitudinal section through the same type, (*b*) the accessory lobes, (*c*) walls of mid-gut, (*d*) walls of the oesophagus. C, the vase-like type in side view and seen from outside. Main lobes lined, intermediates dotted. The accessory of the main (*b*) and intermediate lobes (*f*) are indicated. The main lobes, inside the intermediates, largely overlap them.



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" Patterns " of proventriculus. Drawings of two main and one intermediate lobes viewed from the inside. Fig. 1, *Noterus sparsus* ; fig. 2, *Hyphydrus ovatus* ; fig. 3, *Hygrotus impressopunctatus* ; fig. 4, *Deronectes* 12-*pustulatus* ; fig. 5, *Oreodytes halensis.*

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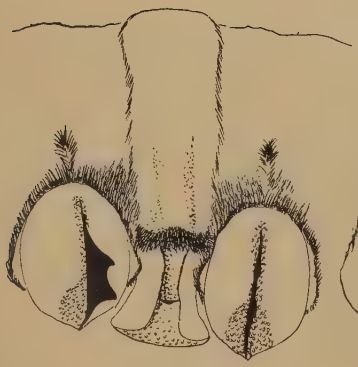

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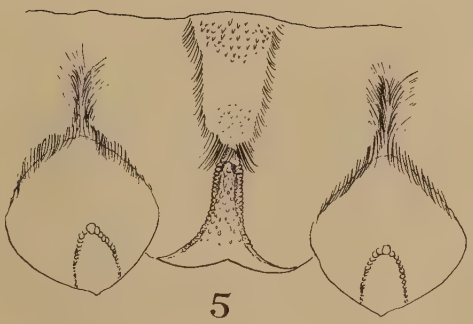

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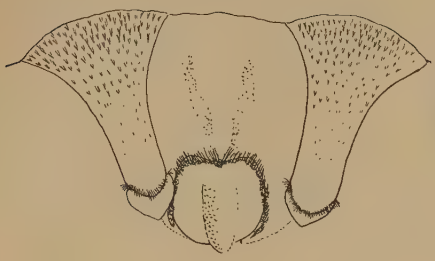
" Patterns " of proventriculus (*continued*). Fig. 1, *O. borealis* ; fig. 2, *Hydroporus palustris* ; fig. 3, *Laccornis oblongus* ; fig. 4, *Meladema lanio* ; fig. 5, *Copelatus agilis*.

" Patterns " of proventriculus (*continued*). Fig. 1, *Pelobius tardus* ; fig. 2, *Agabus nebulosus* ; fig. 3, *Dytiscus dimidiatus*, showing artefact division of the main lobes into two ; fig. 4, *Cybister tripunctatus*.



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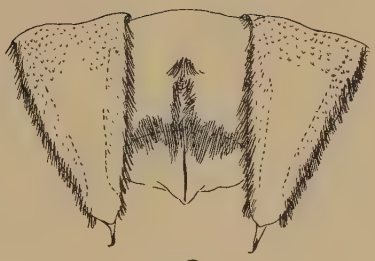

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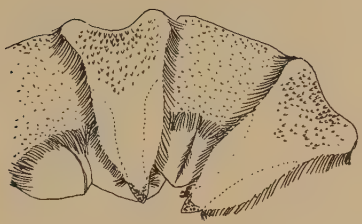

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" Patterns " of proventriculus (*continued*). Fig. 1, *Laccophilus obscurus* ; fig. 2, *Hydaticus transversalis* ; fig. 3, *Copelatus marginatus* ; fig. 4, *Acilius sulcatus*, showing artefact division of the main lobes into two.

A grouping of Genera based upon Characters of the Proventriculus.

1. Main lobes of proventriculus oval . . . . . 2.
   Main lobes triangular . . . . . 6.
2. Chitinous "teeth" across the oval . . . . . 3.
   No "teeth" across the oval . . . . . 5.
3. Oval complete . . . . *Hyphydrus, Hygrotus, Hydroporus, Laccornis.*
   Oval cut off anteriorly or posteriorly . . . . . 4.
4. Oval excised at anterior end . . . . . *Noterus.*
   Oval cut off posteriorly . . . . . *Oreodytes, Deronectes.*
5. A longitudinal ridge down the middle of the main lobe *Colymbetes, Rhantus, Meladema.*
   A horseshoe pattern of small knobs towards posterior end of main lobe *Copelatus* subg. *Liopterus.*
6. Intermediate lobes with a large oval region posteriorly and not ending in a hairy point . . . . . 9.
   Intermediate lobes either tapering to a point or rounding off suddenly to a point, below and behind which is a small accessory lobe . . . . 7.
7. Accessory lobe below intermediates very distinct . . . . . 8.
   Accessory lobe below intermediates almost non-existent . . . *Pelobius.*
8. Main lobes armed anteriorly with numerous backwardly-directed minute spines . . . . . *Agabus, Platambus, Ilybius.*
   Main lobes covered only with fine hairs . . . . . *Dytiscus, Cybister.*
9. Oval of intermediate lobes armed with a longitudinal ridge, fine or thick, or with strong hairs tending to form tufts . . . . . 10.
   Oval of intermediates unarmed . . . . . *Laccophilus.*
10. Posterior to the small accessory lobes of mains and intermediates, a pattern of hairy ridges and grooves . . . . . *Acilius, Graphoderes.*
    Posterior to small accessory lobes, no such pattern *Eretes, Hydaticus, Copelatus* s. str.

With regard to the list, the nomenclature for the British species is that of Fowler's *British Coleoptera*, except in a few cases where Fowler's name is given in brackets. The names of foreign species are mostly from Zimmermann's list (*Coleopterorum Catalogus*, **71,** 1920). The Canadian species, *Rhantus suturellus*, is possibly identical with what Fowler describes as *bistriatus*, Bergstr., which is not the continental species, so called. I shall be discussing this question elsewhere.

It seems probable that a more detailed study of the patterns of the proventriculi will reveal characters upon which the genera I have grouped together can be separated, but my only object in the present paper is to bring to the notice of others the peculiarities of the proventricular patterns. Great care is necessary in mounting the material as I have barely escaped using one or two artefacts as good characters. For instance, in pl. IV, fig. 3, and pl. V, fig. 4, of *Dytiscus dimidiatus* and *Acilius sulcatus*, it will be noticed that the main lobes are apparently divided by a constriction into an anterior and a posterior area. When I found that other species in these genera did not show it, I thought that this must be a specific peculiarity, but, as a precaution, I mounted other specimens and found that I could produce the constriction by pressure. The preparation of the material is usually best achieved by boiling the whole insect in strong potash until all the soft parts have dissolved. The terga of the anterior abdominal segments are then removed and the large posterior end of the oesophagus is exposed. The proventriculus almost always becomes separated from the mid-gut during the boiling, and the small tapered end of the organ is held

with fine forceps while the oesophagus is cut across with scissors. A fine needle-scalpel is now inserted into the open end of the proventriculus and is gently pushed through the opening at the posterior end. Gentle rubbing along the edge of the scalpel cuts the wall of the proventriculus and it is then possible to lay it out more or less flat, although the springiness of the chitin tends to make it curl up. The proventriculi of the smaller species are mounted under a small coverslip without any support, although a few fragments of thin glass (no. 1 coverslip thickness) improve the mount by preventing excessive pressure on the specimen. With all the larger species fragments of broken glass under the coverslip are necessary as, otherwise, the structure is flattened and distorted and very difficult to interpret. The drawings are diagrammatic and only indicate the chief features.

NOTES ON SOME AUSTRALIAN COLLEMBOLA

By H. Womersley, A.L.S., F.R.E.S.
(*Entomologist, South Australian Museum.*)

Symphypleona.

Sminthurus denisii, nom. n.

Sminthurus longicornis, Womersley 1932.

My valued correspondent Dr. J. R. Denis has pointed out to me that the name *longicornis* was used for a species of *Sminthurus* by Joseph as long ago as 1882. Although Joseph's species is probably unrecognisable at the present time, the name *longicornis* must be discarded for my species. I have therefore pleasure in renaming it after Dr. Denis.

Parakatianna pulchella, Womersley 1933.

This species has so far only been found in Western Australia. I can now record it as occurring in moss from Waterfall Gully, South Australia, in May 1933.

Arthropleona.

Brachystomella geniculata, sp. n. (fig. 1, a–c).

Description: Length 1·25 mm. Colour light-grey, except on the dorsum and head

Fig. 1.—*Brachystomella geniculata. a*, ocelli and post-antennal organ of right side; *b*, extremity of foot with claw; *c*, dens and mucro of spring.

which are bluish. Ocelli 8 on each side on dark patches. Postantennal organ present with four peripheral lobes. Antennae slightly longer than head; ratio of segments I : II :

III + IV = 10 : 13 : 32, III and IV not distinctly differentiated, sensory organ on III indeterminate, IV with trilobed apical knob and 2 or 3 olfactory hairs. Claws long and narrow without teeth, empodial appendage absent, clavate tibiotarsal hairs absent. Furca short, mucro half the length of dens and with a large inner basal lamellar lobe and a smaller median outer lobe; dentes with five spines three of which are large stout and geniculate. Rami of tenaculum with 3 barbs. Clothing of sparse short curved setae. Anal spines absent.

Locality : in fungi, South Australia : Bridgewater, 6 June, 1932 (*D.C.S.*).
Syn-types in the South Australian Museum.

Brachystomella terricola, sp. n. (fig. 2, a–e).

Description : Length 2·0 mm. Colour of a deep bluish-black; ocellar patches black. Antennae slightly shorter than the head, ratio of segments I : II : III : IV = 6 : 6 : 6 : 10, sensory organ on III apparently absent?, IV with a terminal organ consisting of a rosette of lobes accompanied by three stout slightly curved rod-like setae, subapically with two

Fig. 2.—*Brachystomella terricola.* *a*, right antenna; *b*, apex of terminal antennal segment, showing sense-organs; *c*, head of maxilla; *d*, extremity of foot with claw; *e*, dens and mucro with spring.

organs each consisting of a groove at the inner edge of which is a stout slightly curved rod-like seta. Ocelli 8 on each side, equal. Postantennal organ absent. Claws with basal inner tooth; empodial appendage absent. Clavate tibiotarsal hairs absent. Furca short, mucro subequal to dens, with short inner lamella; dens with 6 normal setae. Mandibles wanting, maxillae with normal toothed head. Rami of tenaculum with 3 barbs. Anal spines wanting. Clothing of sparse short setae.

Locality : West Australia : Middle Swan, 7 June, 1932 (*H.W.*).
Syn-types in the South Australian Museum.

Key to the Australian Species of Brachystomella.

1. Postantennal organ present . . . . . 3.
   Postantennal organ absent . . . . . 2.
2. Small species, 1·0 mm. Colour yellowish, head and antennae bluish. Ant. IV with a trilobed apical knob. Claws without inner teeth. Mucro with two triangular lobes; dentes with three strong spines
   B. acantha, Wom. 1933.
   Larger species 2·0 mm. Colour deep bluish-black. Antennae IV with a many-lobed rosette-like apical knob accompanied by three rod-like setae; this segment also with two subapical sensory organs. Dental setae normal
   B. terricola, sp. n.
3. Postantennal organ a rosette of about 12 lobes. Cuticle granular. Head of maxillae not typical, as in *Anurida* . . . . . *B. anomala*, Wom. 1933.
   Postantennal organ with not more than 6 lobes. Maxillae typical . . . 4.
4. Furca absent. Postantennal organ with 5 lobes. Tibiotarsus with 3 strongly clavate hairs . . . . . *B. afurcata*, Wom. 1933.
   Furca present . . . . . 5.
5. Large species 3·5 mm. Postantennal organ with 4 lobes. No clavate tibiotarsal hairs. Mucro with large basal inner lobe and slightly smaller medial outer lobe . . . . . *B. fungicola*, Wom. 1933.
   Smaller species not more than 1·5 mm. . . . . 6.
6. Dentes with 3 strong geniculate setae; mucro with inner basal lobe and smaller medial outer lobe. Claw without inner tooth, long and narrow
   B. geniculata, sp. n.
   Dentes with only normal setae; mucro without lamellar lobes. Tibiotarsal hairs indistinctly clavate . . . . . *B. parvula* (Schäffer).

Pseudanurida billitonensis, Schött 1901
= *Neachorutes glauerti*, Womersley 1933.

It was not until after my paper (1933, *Proc. Roy. Soc. S. Aust.*, **57** : 48–71) was about to be published that I was able to see a copy of Schött's "Apterygoten von Neu Guinea und den Sundainseln" (1901, *Termesz. Fuzetek*, **24** : 317–331). His descriptions and figures leave no doubt but that my genus and species are synonymous with his.

Tullbergia quadrispina, Börner 1901

Specimens of this European species were collected by Prof. G. E. Nicholls at Gooseberry Hill, Darling Ranges, West Australia, in June 1932.

ZWEI NEUE *AËDES*-LARVEN (DIPT. CULICIDAE) AUS DEM SÜD-USSURI GEBIET (SÜD-OST SIBERIEN)

Von A. Montschadsky

(*Leningrad.*)

Die bisher noch unbekannten Larven von *Aëdes* (*Finlaya*) *togoi*, Theo., und *Aëdes* (*Stegomyia*) *galloisi*, Jam., waren in reichlicher Menge während der hydrofaunistichen Expedition der Akademie der Wissenschaften von U.S.S.R., im fernen Osten im Jahre 1927 von Dr. A. Stackelberg und Dr. P. Rezwoy gesammelt und mir freundlichst übergeben. Ihnen beiden bin ich zum herzlichsten Dank verpflichtet.

1. *Aëdes* (*Finlaya*) *togoi*, Theo. (Figs. 1–2.)

Larve des IV Stadiums. Kopf intensiv pigmentiert, dunkelbraun, mehr breit als lang; maximale Breite liegt zwischen den Augen; am vorderen Rande etwas abgeflacht. Kom-

Fig. 1.—*Aëdes* (*Finlaya*) *togoi*, Theob. Larve IV St.
A.—Kopf, b.—Platte des Labiums.

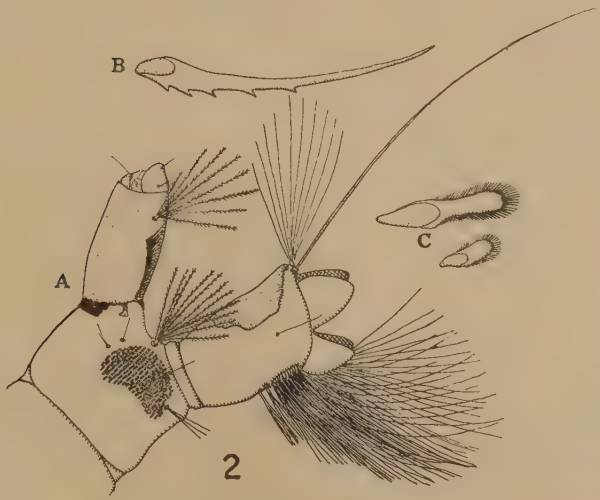

Fig. 2.—*A.* (*F.*) *togoi*, Theob. Larve IV St.
A.—Hinterende, b.—Kammzahn, c.—Striegelschuppe;
b und c stark vergrössert.

plexaugen und die Ocellen gut entwickelt. Fühler gerade, fast cylindrisch, fein aber unregelmässig bedornt. Oft ist eine der Seiten des Fühlers fast ohne Dornen. Das Schafthaar zweiteilig, steht in der Mitte auf der dorsalen Seite des Fühlers und ist $\frac{1}{3}$ so lang, wie der Fühler. Die Kopfhaare gut entwickelt, relativ kurz aber stark geteilt. Die Stirnhaare liegen in einer leicht gebogenen Reihe, das äussere Paar etwas mehr von den beiden inneren entfernt. Stirnhaarformel: 6–7; 7–8; 11–13; 11–13; 7–8; 6–7. Preantennalhaare kurz, 7teilig, zwischen den inneren Stirnhaaren.

Körper schwach pigmentiert. Die Dorsalseite der Haupttracheenstämme mit Pigmentzellen bedeckt. Chaetotaxie schwach entwickelt. Die ventralen und dorsalen Haare des Körpers kurz und wenig geteilt. Nur die Pleuralhaare gut entwickelt.

Striegel aus 80–125 eng zusammenliegenden Schuppen im dreieckigen Fleck mit stark abgerundeten Seiten. Die Schuppen sind ihrer Form nach für *Aëdes*-Larven ganz uneigen und erinnern mehr an einige *Theobaldia*-Larven. Der basale Teil der Schuppe gedehnt und verjüngt; das Distalende nicht mit einem Hauptdorn, sondern abgerundet. Am Rande liegt eine Reihe von kleinen zahlreichen Dornen, die bis zum basalen Teil reicht, wo die Dornen sich allmählich verkürzen. Die Schuppen variieren sehr ihrer Form und Grösse nach. Fünf Haare umranden den hinteren Rand des Striegels (No. 6, 7, 9, 11 und 13). Haar 6-kurz, 2–3teilig; 7-kurz und einfach; 9-ein mächtiger Haarbusch aus 10–12 leicht gefiederten Ästen, die in vertikaler Ebene fächerförmig angeordnet sind; 11-wie 7-kurz und ungeteilt; 13–4teilig, mit schwach gefiederten Strahlen.

Atemrohr intensiv sklerotisiert, von hell–bis dunkel–braun; die Sklerotisierung nimmt stark zum basalen Ende zu. Atemrohr fast cylindrisch, am vorderen Rande etwas mehr konvex als am hinteren, an der Basis um 10–15% breiter als am distalen Ende. Atemrohrindex 1, 8–2, 3. Solche starke Variabilität ist durch eine basale Seiteneinbuchtung erfolgt, deren Tiefe die Länge des Rohres veranlasst. Ventralbusch mächtig entwickelt, fast zweimal so lang als die Breite des Rohres, aus 7–10 fächerförmig angeordneten leicht gefiederten Strahlen, stark hinter der Mitte des Rohres, in seinem letzten Drittel. Atemrohrkamm stark entwickelt, mit eng gestellten Zähnen, reicht ungefähr bis $\frac{2}{3}$ der Atemrohrlänge, aus 18–25 langen schmalen zugespitzten Zähnen, von denen die 4–6 basal liegenden kurz und dornenartig sind; die anderen verlängern sich in distaler Richtung allmählich und tragen am unteren Rande 2–5 Nebenzähne, die von einander weitgestellt sind.

Analsegment länger als Atemrohr, am Ende breiter als an der Basis. Sattel länger als hoch, bedeckt nur die dorsale Fläche des Segments auf $\frac{2}{3}$ seiner Länge und nur ein wenig die Seitenflächen. Hinterrand des Sattels mit zahlreichen kleinen Dornen bedeckt, die nach vorn und den Seiten zu, sich verkürzen und verschwinden. Seitenhaar einfach, nicht länger als die Kiemen. Die Form der letzteren ist sehr auffallend. Sie schwankt von einer zugespitzten blattförmigen bis zu einer eiförmigen oder halbovalen. Das dorsale Paar, wie bei *Aëdes geniculatus*, Ol., stärker entwickelt als das ventrale. Innere dorsale Schwanzhaare 9–11teilig, fächerartig geordnet, auf $\frac{1}{3}$–$\frac{1}{4}$ länger als der Analsegment. Äussere Schwanzhaare stark, einfach, mehr als $2\frac{1}{2}$ mal länger als die inneren. Ruder aus 6–7 Paar 7–12strahligen Quasten mit gut entwickeltem Stützapparat und mit 1–2 bedeutend kürzeren und schwach geteilten Haaren vor ihm.

Die Larven wurden in grossen Mengen gefunden von P. Rezwoy und A. Stackelberg in einer stark besonnten kleinen (0·5 × 0·5 m.) Aushöhlung in einem Steine, die 15 cm. hoch mit Regenwasser gefüllt war, in dem Garten des Stadtmuseums von Wladiwostock, in der ersten Hälfte von August.

2. *Aëdes* (*Stegomyia*) *galloisi*, Jam. (Figs. 3–4.)

Larve des IV Stadiums. Kopf hell pigmentiert, mehr breit als lang; maximale Breite liegt zwischen den Augen; Vorderrand konvex und gerundet. Komplexaugen sind sogar

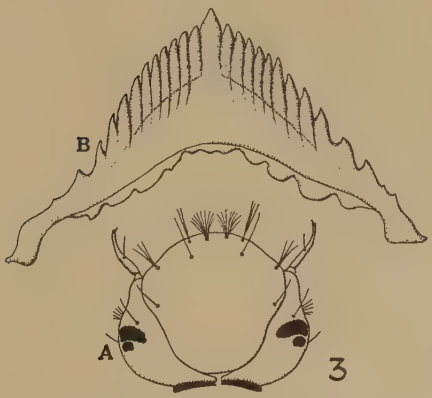

Fig. 3.—*Aëdes* (*Stegomyia*) *galloisi*, Jam. Larve IV St.
A.—Kopf, b.—Platte des Labiums.

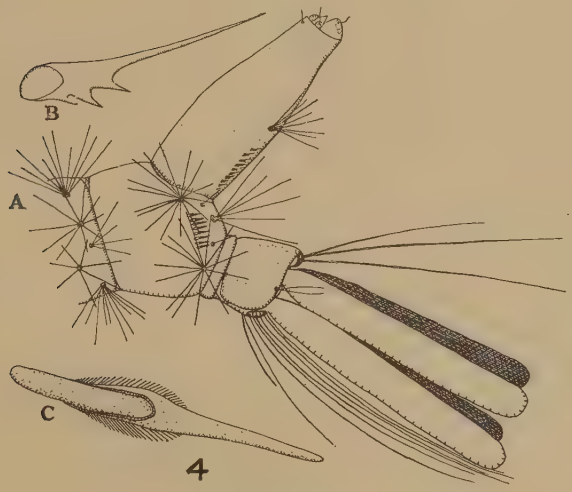

Fig. 4.—*A.* (*S.*) *galloisi*, Jam. Larve IV St.
A.—Hinterende, b.—Kammzahn, c.—Striegelschuppe;
b und c stark vergrössert.

am Ende des IV Stadiums schwach entwickelt, was als Folge der Lebensweise in dunkeln Baumhöhlen zu betrachten ist; Ocellen vorhanden. Fühler nach innen und ventral leicht gebogen, nicht bedornt, von der Insertion des Schafthaares allmählich verjüngt. Schafthaar in der Mitte des Innenrandes, kurz und einfach. Kopfhaare relativ kurz, schwach geteilt. Stirnhaare in ein Dreieck geordnet: die inneren vor den mittleren, die am längsten sind. Stirnhaarformel: 2–3; 1; 2–3; 2–3; 1; 2–3. Preantennalhaare zwischen den inneren Stirnhaaren, 9–10teilig, die Strahlen fächerartig geordnet.

Chaetotaxie des Körpers stark entwickelt, erinnert an die von *A.* (*F.*) *geniculatus*. Die Mehrzahl der Haare ist sternartig geteilt. Die Teilung ist viel reicher als bei *geniculatus*.

Striegel aus 8–12 Schuppen (am öftesten 9–10) in einer Reihe. Jede Schuppe besteht aus einem Hauptzahn mit feiner Seitenbehaarung an seiner Basis, die etwas erweitert und ausgedehnt ist. Nebenzähne fehlen, selten rudimentär. Von fünf Haaren die den Striegel umgrenzen sind die Haare 7 und 11 einfach und kurz; die Haare 6, 9 und 13 stark entwickelt und sternartig geteilt.

Atemrohr intensiv sklerotisiert, besonders am vorderen Teile der Basis, deren Seiten- und Hinterrand eine kleine Ausbuchtung besitzen. Das Rohr erweitert sich in der Mitte und ist gegen das Ende beträchtlich verjüngt (ungefähr 60% der Breite an der Basis). Atemrohrindex: 2, 9–3, 1. Bemerkenswert ist das Fehlen der seitlichen Auswüchse der Basis, was für die Larven der Untergattung *Stegomyia* ein spezifisches Merkmal zu sein scheint. Ventralbusch in der Mitte des Rohres, schwach entwickelt, aus 4–8 Strahlen, dessen Länge weniger als die Breite des Rohres an der Basis ist. Bei einer Larve stand ein Busch dicht bei dem Kamm, der andere war gegen das Ende verschoben. Kamm aus 10–16 kleinen dornenartig zugespitzten Zähnen, die eine breite Basis haben, dessen unterer Seitenrand mit 1–3 gut entwickelten Nebenzähnen versehen ist. Bei *A. galloisi* findet man oft keine Verminderung der Zähne des Kammes der Basis zu. Was die Nebenzähne anbetrifft, so nimmt ihre Zahl und der Grad ihrer Entwickelung dem distalen Ende zu; die basalen Zähne können auch ganz ohne Nebenzähne sein.

Analsegment sehr kurz, weniger lang als breit. Sattel gut entwickelt, reicht bis zur ventralen Seite des Segments. Bei einigen Larven war der Sattel ventral ganz verschlossen. Seitenhaar ziemlich kurz, 2–4teilig. Ruder schwach entwickelt, aus drei Paar schwach geteilten (höchstens 2teiligen) Quasten, deren Basen einen Stützapparat für den Ruder bilden, und nur ein Paar viel kürzere Haare vor ihm. Dorsale Schwanzhaare steif aus einem äusseren Paar langen einfachen und einem inneren Paar kürzeren zweiteiligen Haarborsten. Die Analkiemen erinnern der Form und dem Entwickelungsgrade nach an die von *A. pulchritarsis* (Montschadsky, 1926, Bull. ent. Res., **17 : 151**). Bei *A. galloisi* sind sie auch wurstförmig, mit abgerundeten Enden. Ihre Länge variiert sehr: sie sind länger als das Atemrohr um 20–60%. Wie bei *A. pulchritarsis* steht bei *A. galloisi* die starke Entwickelung der Analkiemen mit einer weitgehenden Reduktion des Ruders in engster Korrelation, deren funktionelle Bedeutung in dem Übertragen der lokomotorischen Funktion auf die gut entwickelten Kiemen besteht, während das reduzierende Ruder mit den dorsalen Schwanzhaaren eine Stützfunktion für die Kiemen übernimmt. Direkte Beobachtungen an lebendigen Larven von *A. pulchritarsis* und später an denen von *A. argenteus*, wo die Beziehungen zwischen den Analkiemen und dem Ruder die gleichen sind, geben mir das Recht hier zu behaupten, dass auch bei *A. galloisi* ein Übertragen der lokomotorischen Funktion von dem Ruder auf die Analkiemen stattfindet.

Die Larven von *A.* (*S.*) *galloisi* wurden in Baumhöhlen der "schwarzen Birke" (*Betula daurica*) von P. Rezwoy und A. Stackelberg gefunden, im Anfang Juli am Süd-westlichen Ufer des Sees Khanka (Dorf Kamenj Rybolov), wo die Art sehr verbreitet zu sein scheint, und in Distrikt Spassk, östlicher von Khanka (Dorf Jakowlevka).

SOME NEW GEOMETRIDAE (LEP.) FROM FIJI

By Louis B. Prout, F.R.E.S.

An extraordinarily interesting collection of Geometridae from Fiji, almost exclusively from Vunidawa (*H. Phillips*), received for determination through the Imperial Institute of Entomology, marks an enormous advance in our knowledge of this section of the Fijian fauna. Not only does it contain further representatives of several of the forms described in my two recent papers (1929, 1930, *Ann. Mag. nat. Hist.*, (10) **3**: 595–597; **6**: 690–697), the hitherto unknown ♂♂ of *Agathia dimota*, Prout (1911), and *Polyclysta gonycrota*, Prout (1932), the first specimens received in Britain of *Gelasma stuhlmanni*, Prout (1933), and *Perixera prionodes*, Meyr. (1886), and several species hitherto unrecorded for Fiji, but it also yields no less than 21 new species, including several very striking ones. There are at least two other new species, not yet considered ripe for description, and some probably new races which I have felt should await confirmatory material.

All the types have been presented to the British Museum.

Subfam. Hemitheinae.

1. **Gelasma quadrizona,** sp. n.

♂, 31 mm. Face brown-black. Palpus 1¼, second joint rather slender, third moderate (about ½); whitish beneath, terminal joint dark. Antennal shaft white proximally; pectinations very long, apical part (rather over ¼) non-pectinate. Crown white. Collar concolorous with costa, thorax with wings. (Abdomen wanting.) Hind tibia with pencil but without process.

Fore-wing with SC^1 anastomosing shortly with *C*, R^1 connate, M^1 barely stalked; pallid purple-drab, shining, almost iridescent, with a suggestion of pale olive-grey; a costal border (about to *SC*) clean pale olive-buff, the extreme edge brighter, yellower; cell-mark whitish, elongate, not very conspicuous; markings between drab and greyish-olive, consisting of four narrow bands (at widest 1 mm.); antemedian and median straightish, as far from base at hind margin as at *SC*, the median just proximal to the cell-mark; postmedian not quite so straight, appreciably excurved at radials and slightly oblique outward to hind margin; subterminal weaker than the others, about midway between postmedian and termen.—*Hind-wing* with angle at R^3 very slight; cell about ⅓, M^1 longer stalked than SC^2; concolorous with fore-wing; cell-mark similar or rather narrower, more conspicuous; postmedian and subterminal lines present, continuing respectively the median and postmedian of the fore-wing, both curved about M^1.

Underside without markings, the costal part of the fore-wing, except the extreme edge, scarcely differentiated in colour.

Vunidawa, 30 May, 1932, 1 ♂.

2. **Gelasma** (?) **albifulgens,** sp. n.

♀, 35 mm. Face red-brown, white below. Palpus over 2, second joint smooth, third joint long (about 1); white, with second and third joints red-brown above. Crown and antennal shaft proximally white. Thorax and abdomen concolorous with wings; fore-leg partly reddened above and on inner side.

Fore-wing broad, costa noticeably arched, apex rather blunt; SC^1 from cell, anastomosing with C and at a point with SC^2, M^1 about connate; glossy whitish, with rather dense irroration and strigulation of light mouse-grey; extreme costal edge red-orange; a mouse-grey cell-mark, widening posteriorly to enclose a whitish streak; two zigzag white bands, bordered (the antemedian externally only) with narrow opaque areas which are slightly on the olive side of mouse-grey; antemedian from scarcely $\frac{1}{5}$ costa to $\frac{1}{3}$ hind margin, hardly more than a broad line, angled outward on the veins, strongly inbent in submedian area; postmedian band rather near termen, on an average about 1 mm. wide, with strong pairs of teeth outward at R^{1-2} and M^{1-2}, deeply incurved between these pairs and again at fold; fringe proximally white, with very weak chequering, distally more mouse-grey.—*Hind-wing* fairly broad, termen waved to subcrenulate, the angle at R^3 moderately strong; M^1 about connate; nearly as fore-wing, but without the antemedian markings, the postmedian narrower, less deeply incurved in the middle.

Underside paler, without distinct markings, the white cell-marks and postmedian faintly suggested; fore-wing with slightly drab suffusion as far as the postmedian (except behind fold).

Vunidawa, 18 January, 1933, 1 ♀.

Strikingly distinct. In the absence of the ♂ the position is uncertain; possibly related to "*Gelasma*" *cynthia*, Warr. (1899), though not closely; possibly nearer to *Iodis*.

3. **Thalassodes liquescens,** sp. n.

♂, ♀, 42–44 mm. Face green. Palpus moderate, terminal joint in ♀ about 1, in ♂ rather less; whitish, with terminal joint green. Crown green, fillet and scaled area of antenna white. Thorax and abdomen above green, beneath mostly white. Hind tibia of ♂ with hair-pencil and short terminal process.

Fore-wing in ♂ with apex sharp, termen oblique; in ♀ rather more rounded; *DC* deeply incurved; pale grey-green (between olive-buff and water-green); costal edge narrowly buff; lines greener, oblique outward, the antemedian from costa at 4·5 mm. to hind margin at 6 mm., the postmedian approximately parallel with it (but somewhat more sinuous and less definite), from towards middle of costa to hind margin 4 mm. from tornus; ill-defined whitish bands proximally to the ante- and distally to the postmedian; fringe greyer, with a whitish line at base.—*Hind-wing* with termen very faintly waved, the angle (or bend) at R^3 extremely slight; *DC* markedly sinuous (the inward curve occupying the anterior half of DC^3), scarcely oblique enough for a true *Thalassodes*, though more so than in *zebrata*, Warr., which at present stands in this genus; concolorous with fore-wing; a short white cell-streak; a line from just outside this, rather broad and (especially posteriorly) not sharp, running outward much more than hindward, reaching M^1 at 3–4 mm. from termen, posteriorly with the normal bending of *Thalassodes*; no second line developed, the vague outer whitish band commencing near the first line at costa and meeting it about R^3 or M^1.

Underside uniform whitish green, with the fringes nearly as above.

Vunidawa, 1 ♂, 2 ♀♀.

May be placed between *zebrata*, Warr. (1906), and *effata*, Prout (1916).

Subfam. Sterrhinae.

4. **Sterrha bathromyses,** sp. n.

♀, 20 mm. Face blackish in upper part, pale below. Palpus slender, slightly over 1, terminal joint distinct; somewhat darkened on outerside. Tongue well developed. Vertex

whitish buff. Collar slightly more buff than thorax. Thorax, legs and abdomen mainly concolorous with wings, a dark patch on metanotum and first few tergites of abdomen, on the abdomen almost cut in two by a pale centre.

Fore-wing not broad, termen very gently curved, not elongate, not very oblique; areole rather small, SC^{1-5} stalked considerably beyond it; pale indeterminate buff, a little paler and less bright than pinkish buff of Ridgway (nearly as in the least reddish forms of *actiosaria*, Walk.), with very indefinite greyer clouding on both sides of the subterminal; irroration slight, very sparse; cell-dot very small, blackish; lines almost obsolete, but forming large and conspicuous costal dots at slightly less than $\frac{1}{3}$ and at fully $\frac{2}{3}$; antemedian oblique inward except near costa, postmedian indicated by weak vein-dots, oblique outward to about middle (but with an inward curve between the radials), posteriorly more nearly parallel with termen; an ill-defined median shade, at first close to postmedian, but very deeply incurved posteriorly and running to hind margin about middle; subterminal waved, decidedly sinuate inward between the radials, its proximal shade slightly strengthened between SC^4 and R^1; extreme termen of the pale ground-colour; fringe with minute but sharp dots at the vein-ends.—*Hind-wing* with termen moderately but not perfectly regularly rounded; stalking of SC^2 quite short, M^1 connate; very weakly marked except for a small bone-brown to blackish basal patch (fully 1 mm.); the pale subterminal defined by some weak dark maculation proximally; fringe-dots as on fore-wing.

Underside rather paler; hind-wing and fringes unmarked; fore-wing in cell and in the same positions as above with faint greyish suffusions, the distal one the faintest, not (as above) reaching nearly to termen.

Vunidawa, 14 February, 1932 (type), 4 others subsequently.

Probably near *rhipistis* (Meyr., 1886, *Pythodora*); among a series of ♀♀ collected for Druce at Suva, Viti Levu, I have detected 3 extremely worn specimens of *bathromyses*; rather longer-winged, not quite so glossy, the lines much less parallel with one another and with termen, the costal spots (of which there is no trace in *rhipistis*) well discernible even in the most worn examples. As in *rhipistis*, SC^5 of the fore-wing can arise either nearly opposite SC^1 or considerably proximal to it, perhaps sometimes even from the apex of the areole.

5. **Sterrha dicenea,** sp. n.

♀. Differs from the preceding as follows :—

More fuscous-suffused (sometimes almost wholly so); cell-dots more minute; postmedian more distally placed, at least as far from cell-dot as from termen, between the radials not incurved, at costa of fore-wing not forming such a large black spot; subterminal expanding into conspicuous white spots at both folds, the one between the radials touching the postmedian line.

Vunidawa, 31 December, 1931, 2 January, 18 January and 7 February, 1932, the last (the type) further labelled "Rewa River."

An extremely wasted ♂ from the same source (31 May, 1932) shows the postmedian line and the subterminal spots and can therefore be definitely referred here, not to *bathromyses*; antennal fascicles at least 2, almost as in *rhipistis*; hind tibia with a very strong red tuft, also approaching that of *rhipistis*.

The hind-wing has SC^2 and R^1 generally better stalked than in *rhipistis* and *bathromyses*, though the variability of detail in all three precludes the use of this tendency as definitely differential.

Subfam. Larentiinae.

6. **Scotocyma miscix,** sp. n.

♀, 40–41 mm. Evidently at least as variable on the upperside as the genotype (*albinotata*, Walk. 1866), no two of the ♀♀ yet known being at all alike. Apart from its large size, distinct in the slightly shorter cells (in fore-wing $\frac{5}{12}$, in hind-wing barely $\frac{1}{3}$; in *albinotata* $\frac{4}{9}$ and about $\frac{2}{5}$ respectively), strongly curved *DC* of fore-wing, with R^2 arising very near R^3, that of the hind-wing arising a very little behind the cell-fold (in *albinotata* continuing it), postmedian relatively a little more proximal, white subterminal spot not developed, antemedian of fore-wing with more bends, but without the acute angle in cell shown by *albinotata*; underside more variegated, in places suffused with reddish.

Vunidawa, 3 ♀♀.

The type has the upperside dark almost throughout, the median band and other dark markings blackish, a warmer brown colour showing chiefly between the pale edge of the postmedian and the slender subterminal (*i.e.* nearly as dark and dull as the type of *albinotata*). One aberrant specimen has the warm brown predominating, the median band only dark-clouded in its proximal part and even here with an admixture of light grey-blue scaling; a slender dark proximal-subterminal shade on the fore-wing and more extended terminal dark shades on the hind-wing. The third specimen is very striking, bearing ample pure-white markings on a dark ground: on fore-wing a spot close to base, the distal two-thirds of median band (except at costa), a narrow wavy band just outside the postmedian and a large mid-terminal spot; on hind-wing only the last-named and the abdominal end of the band outside the postmedian.

7. **Chloroclystis encteta,** sp. n.

♀, 16–19 mm. Body and wings white, with the markings brown, reddish and blackish, remarkably similar in colour and arrangement to those of *exilipicta*, J. Joann. (1906), from Mauritius. Chiefly distinguishable from that species by the slightly shorter palpus, single, in part sharply blackened, antemedian line, on the fore-wing obsolescence of the anterior subterminal band, on the hind-wing suppression of red suffusion in median area and different formation of postmedian line—here bluntly angled at R^1, in *exilipicta* more strongly outbent and with the angle at R^2. In *encteta*, moreover, the line midway between postmedian and termen of the hind-wing is better developed and SC^1 of the fore-wing anastomoses to about half its length with *C*, while in the specimens of *exilipicta* which I have examined it runs into *C*.

Vunidawa, February, July, November and December 1932, 4 ♀♀.

8. **Chloroclystis fluctuosa,** sp. n.

♀, 12–14 mm. Probably—so far as can be judged without the ♂—an outlier of *sordida*, Warr. (1903), but with the shape of the hind-wing as in *mempta*, Prout (1928). Palpus about as in *sordida*, i.e. a little less long and heavily scaled than in *mempta*. Wings as dark as in *sordida*, a little browner; markings similar, the lines of the median area still less inclined to form bands; most different in the postmedian group, which, after the initial bend in front of R^1, is much more regular, showing only a faint indication of the sinus between the radials and scarcely any indication of the lunulate formation of the posterior part; subterminal of fore-wing thickened into a noticeable (though not large) spot behind R^3, not quite reaching M^1. Underside with a whitish and a few slightly

darkened costal spots on the fore-wing distally (much as in *sordida*), without the conspicuous postmedian spot of *mempta*. Underside of fore-wing costally and of hind-wing with faint reddish flush.

Vunidawa, June, November and December 1932, 3 ♀♀.

9. **Chloroclystis rubicunda,** sp. n.

♂♀, 24 mm. Closely related to *boscra* (Druce 1888). Face, vertex and upperside of thorax and abdomen strongly suffused with red, the latter, especially in the ♂, with some black admixture, becoming whitish at the anal end. The ♂ abdomen—as also in the hitherto undescribed ♂ of *bosora*—extremely elongate, perhaps even more so than in that species.

Fore-wing shaped as in *bosora*, or with termen perhaps still more oblique; a swollen tract in front of *C* on the ♂ underside, which in *bosora* runs distally from the meeting of SC^1 with *C*, not or scarcely developed; the whitish ground-colour largely suffused with red (scarcely brighter than Prussian red), only the posterior half of median and subterminal areas looking white, though the suffusions are less heavy beyond the postmedian than proximally; markings almost exactly as in *bosora*, but heavier, the anterior half of the band-like postmedian suffused with dark olive-grey to blackish; subterminal without the dark proximal patches between the radials and at fold.—*Hind-wing* with SC^2 separate (in the only *bosora* ♂ before me connate or minutely stalked); similarly suffused with red; white dots at base; the raised scales at end of cell (present also in *bosora*, though hitherto not mentioned; perhaps stronger in ♂ than ♀) black-mixed instead of whitish.

Underside of fore-wing unevenly infuscated, entirely without the fleshy red of *bosora*; of hind-wing more infuscated than in *bosora* and with fairly conspicuous dark subterminal band.

Vunidawa, 4 July, 1932, type ♂; 4 November and 1 December, 1932, 2 ♀♀.

10. **Chloroclystis hypotmeta,** sp. n.

♂, 15 mm.; ♀♀, 18 and 21 mm. Wings above in the ♀ very closely suggesting a large, rather pale and not very heavily marked *bryodes*, Turn. (1907), but with the postmedian of the fore-wing rather more proximally placed and its central angle not quite so sharp, that of the hind-wing similarly a trifle less extreme in its angulations; in the ♂ with the principal markings (in costal part of fore-wing and basal of hind-wing) stronger and redder. —Underside (excepting the fringes) suffused with red as in *bosora* (in the ♂ grading from onion-skin pink to testaceous or almost terra-cotta, in one ♀ Japan rose, in the other—possibly more faded—virtually pinkish-cinnamon), from which latter the ♀ is at once distinguished by the characteristic form of the postmedian of the hind-wing above. Fore-wing of ♂ with the costa well arched, shortened, the termen slightly contorted, with a concavity between the radials, the underside here bearing a large lump of specialised scaling; hind-wing of ♂ broad, rather well rounded, with specialised scaling on the upperside of the costal region, the anterior veins probably more or less distorted, their position obscured by a very strong ridge or fold which runs along the underside in the anterior part of the cell and is continued to the termen.

Vunidawa, 3 February, 1933, type ♂, 6 January and 30 May, 1932, 2 ♀♀.

11. **Symmimetis thorectes,** sp. n.

♂♀, 20–22 mm. Head pale. Palpus in ♂ less than 1½. Antenna in ♂ simple. Thorax above concolorous with fore-wing, beneath in the ♂ plated with very large, glossy whitish scales; abdomen above somewhat ochreous-tinged.

Fore-wing shaped about as in *cristata* (Warr.); brown, the markings greyish, with little or no suggestion of green; raised black scaling on *M* as in *cristata* or somewhat slighter; base pale, the rest of proximal area with the lines suffused, almost forming a dusky band; a conspicuous whitish line (very narrow band) at about $\frac{2}{3}$, strongly outbent to R^1, slightly incurved between this and a small prominence between M^1 and fold, then oblique inward; suffused lines of median area slightly paler than those of proximal area; postmedian less sharply lobed outward than in *cristata* and with its projecting part beginning about SC^5; outer markings much as in *cristata*; terminal dashes and the interrupting whitish dots strong, the latter extending on to fringe.—*Hind-wing* shaped as in *cristata* or somewhat shorter costally; similarly marked to that of *cristata*, but with little whitish suffusion between the pale posterior half of the double extra-postmedian band and the termen, though the subterminal is somewhat widened in this half.

Underside much as in *cristata*, excepting the different form of the postmedian of the fore-wing; the whitish parts less sharp.

Vunidawa, 12 June, 1932, type ♂, 27 August and 2 September, 1932, 2 ♀♀. Here belongs also the poor specimen mentioned under "*Neoscelis*" *cristata* in *Insects of Samoa*, Brit. Mus. **3** (3): 145, a ♂ from Suva, Viti Levu (*Woodford*) from the Druce collection.

In the preliminary analysis of the interesting group to which this genus belongs (*loc. cit.*, pp. 144, 145) I fell into a trap which it is necessary to explain. *S. cristata* (= *rivula*, Hmpsn. = ? *muscosa*, Turn.) is not the ♀ to *Hybridoneura abnormis*, Warr., and it is by no means demonstrated that the genus *Neoscelis* should be sunk, as I assumed, though the relationship is fairly manifest. In *Symmimetis* the ♂ antenna is simple, not fasciculate, the abdomen robust, the genitalia withdrawn within the plates of the 8th abdominal somite, the retinaculum wanting, the frenulum extremely short, probably non-functional. This last peculiarity, conjointly with the sexual dimorphism of *Hybridoneura metachlora* (Hmpsn. 1907) and the coincidences of the occurrence of *H. abnormis* with *S. cristata*, led to the overlooking of all ♂♂ of the latter as ♀♀; in fact even Hampson's "♀" type of *rivula* proves on examination to be a ♂, as is also the Hydrographer Mountains form which I provisionally mated (*loc. cit.*) with a race of *H. abnormis*. The only secondary sexual character which I have yet discovered in the ♂♂ of *Symmimetis* resides in the scale-plates of the pectus—hardly less strong in *cristata* than in the new species. The "body-plate" of the 8th sternite in *thorectes* is somewhat tongue-shaped and the coremata pale, whereas in *cristata* the former is strongly bifid and the latter are more or less mixed with blackish.

12. **Brabira apatopleura,** sp. n.

♂, 34 mm.; ♀, 41 mm. Palpus still longer than in *emerita*, Prout (1926), with long coarse suberect scales above and beneath. Hind tibia in both sexes with outer proximal spur wanting, inner long and strong. Abdomen slightly carinated dorsally, laterally with the scaling at posterior ends of the segments strongly metallic (leaden, with bronzy admixture), pleura of 3rd segment with a very large oval patch of differentiated scaling (in ♀ red-brown, in ♂ deep black), ♂ with a spreading anal tuft. Fore-wing in both sexes broad, hind-wing very small (extremest in ♂), with termen almost regularly rounded.

♀ suggestive of a well-marked giant of *emerita*, not or scarcely darker. Hind-wing with cell-fold beneath forming a pronounced ridge.

♂ much darker. *Fore-wing* with apical part more rounded, both costally and terminally, than in *emerita*; ill-defined pale suffusion about the short but sharp black cell-dash, especially on its proximal side; costal spots and the markings from them not very strong;

distal area with alternating blackish and whitish dashes on the veins, the true subterminal presenting the sharpest (whitest) series.—*Hind-wing* with the minute cell scaleless, whitish (foveal?), the rest concolorous with fore-wing.

Vunidawa, May, September and October 1932, 4 ♂♂, 1 ♀.

13. **Sauris enochra,** sp. n.

♀, 28–30 mm. Remarkably similar in shape and markings, as well as in the colour of the hind-wing and underside, to the ♀ of *nigrilinearia*, Leech (1897, Japan). Smaller and with both wings relatively a trifle less elongate anteriorly. Hind-wing with R^3–M^1 connate or closely approximated (in *nigrilinearia* well separate).

Fore-wing almost white, the lines light olive-brownish rather than green; cell-mark weak, not blackened; the blackish costal marks at origin of principal lines very weak; the sharply black subterminal line showing in two of the three examples a more complete duplicating line distally than in *nigrilinearia*.

Vunidawa, 27 February, 27 May and 3 July, 1932.

May prove near *erigens*, Prout (1925); much paler, antenna much less specialised (though with the two shallow excavations above), the postmedian line more bent, the subterminal firmer, etc.

14. **Poecilasthena leucydra,** sp. n.

♂♀, 22–24 mm. Smaller than average *thalassias* (Meyr. 1891), fore-wing with termen appreciably more rounded anteriorly, consequently less produced to apex; ground-colour ("transverse lines" in sens. Meyr.) cleaner white, the group of three postmedian lines well developed, the white ground-colour for some distance on either side thereof comparatively clean, bringing them into bolder relief. Otherwise very similar to that well-known species.

Also very like *paucilinea*, Warr., but with the termen of the fore-wing not gibbous, of the hind-wing not definitely tailed, the lines a little less greyish-green; in the dissecting line of the outer white band it also favours typical *thalassias*, though on the fore-wing this line perhaps begins a tendency to recede from the group of three, *i.e.* is slightly intermediate in position towards that of *paucilinea* (see Warren, *Nov. Zool.*, **13**: 108).

Vunidawa, 4–17 January, 1932, type ♂ and 3 ♀♀.

15. **Poecilasthena inhaesa,** sp. n.

♀, 26 mm. Distinguishable from the preceding not only by its larger size but by its more rounded hind-wing, which shows no appreciable angle at R^3, only a very slight change of direction at this point, and the quite different distribution of the colouring.

Fore-wing with small, indefinite, green basal markings, followed by a narrow, oblique, relatively clean white band; to this succeeds a broad, equally oblique green band, which almost reaches the cell-dot; a relatively clear white median band, 2 mm. wide at its narrowest part, slightly wider anteriorly than posteriorly; three lunulate-dentate green subterminal lines, the proximal two thick (especially perhaps the outer of them), with the white line which separates them a little obscured anteriorly by green dusting, the third thinner, slightly interrupted, but slenderly connected along the veins with the terminal markings; the latter about as in the allies, alternate blackish-green dashes and white dots.—*Hind-wing* with the markings continued (excepting the basal) but with the outer group more proximal (nearly reaching cell-dot), more confusedly confluent, the middle one further thickened, the subterminal also somewhat thickened.

Vunidawa, 8 February, 1932, 1 ♀.

All the "green" colouring is greyish and subdued, in the solid band rather approaching the "storm grey" of Ridgway,* although not quite so dark.

Eoasthena, gen. n.

Face smooth, rounded. Palpus short, rather slender. Tongue well developed. Antenna in ♂ bipectinated with long branches, apical part merely ciliated. Femora glabrous. Hind tibia with all spurs well developed. Thorax and abdomen not crested.—*Fore-wing* with costa more or less arched, apex not acute, termen smooth, curved, tornus moderate or rather weak; *male* with costa strongly folded above, in part with specialised long, almost hair-like scaling, more definitely hairy (broadly so just beyond the retinaculum) on the posterior part of the folded area beneath; retinaculum narrow, very oblique; cell not extremely short, DC^2 rather oblique outward, DC^3 curved, becoming rather oblique outward; venation anteriorly obscure, on account of the folding, only 11 veins discoverable: *C* curving back a little to anastomose shortly with SC^1, which arises fairly well before the end of cell, no areole, SC^{3-5} stalked, R^1 stalked with them, R^2 central or very slightly behind middle of cell, M^1 just separate; ♀ with two large areoles, SC^1 well before apex of outer, SC^5 from apex of the same or sometimes beyond, rest of venation as in the ♂.—*Hind-wing* with apex and tornus moderate, termen sometimes with a bend at R^3 (very weak in type, wanting in *stygna*, scarcely appreciable in *extranea*, pronounced in *catharia*); *male* with cell in type nearly ½ (in *extranea* and *catharia* slightly less long), *DC* weak, fairly simple, cell-vein strong; *C* anastomosing strongly with cell, SC^2 separate (in *extranea* about connate, in *stygna* and *catharia* well stalked), R^2 about central (only in *catharia*, where the principal arm of the cell-fold has its embouchure unusually far forward, well behind the same), M^1 more or less remote at origin from R^3; ♀ with only slight deviations.

Type of the genus: *Eoasthena gnophobathra*, sp. n.

Nearest to *Asthena*, especially in the ♀ characters, but with more nearly the facies of *Eois* and with the heavily pectinated ♂ antenna recalling the *Cambogia* section of that genus.

16. **Eoasthena gnophobathra,** sp. n.

♂, 22–24 mm. Face and palpus pale buffish, with some brownish or fuscous marking. Vertex whiter; occiput red-brown. Front of thorax cinnamon-buff; upperside of the rest of thorax and of abdomen concolorous with wings, heavily clouded (especially thorax and base of abdomen) with rather dark plumbago-slate; underside of body, with legs, cartridge-buff to whitish.

Fore-wing cinnamon-buff, mixed with cinnamon, the ground-colour obscured in posterior half, except proximally, by ill-defined brownish-drab suffusions; markings brownish-drab, becoming more plumbeous on the suffused parts and with some inconspicuous leaden-metallic scales; a small basal patch, with extension along a considerable part of costal margin; a line of the same colour at hind edge of costal fold; cell-mark placed in a rather clear space; lines dusky, partly diffuse, about eleven developed or indicated, somewhat irregular, in places submacular, mostly angled outward, the broadest and most conspicuous being the two which bound the cell-mark (separated from one another by nearly 2 mm. anteriorly, more approximated posteriorly), a line about midway between postmedian and termen (proximal boundary of distal area) also rather thick, especially about R^3, whence there run traces of a longitudinal streak to termen.—*Hind-wing* similarly coloured and marked, but with the cloudings still more extended, so that only a subbasal patch, the cell and a short tract beyond remain clear; basal patch very small.

* 1912, Color Standards & Color Nomenclature, Washington.

Underside considerably paler, with part of costa of fore-wing (especially the middle), some of the principal lines and ill-defined cell-marks dusky.

Lautoka, 3 August, 1931, type ♂; Vunidawa, 7 February, 1932, paratype ♂. Two ♀♀, Lautoka and Rewa River, which pretty evidently belong here, are brighter (more orange-ochreous) than the ♀♀ which I assign to the following species, with straighter postmedian and stronger proximal line of terminal area.

17. **Eoasthena stygna,** sp. n.

♂, 28 or 29 mm. Similar in colour and type of maculation to the genotype, but with many differences. Considerably larger. Thorax and abdomen without the heavy dark cloudings above. Wings relatively more elongate. *Fore-wing* with costal margin more strongly gibbous about end of cell, then somewhat straighter, costal fold represented by a strongly swollen area to little beyond one-fourth wing-length, venation beyond cell distorted, veins SC^4, SC^5, R^1 and R^2 strongly curved, with the convexity hindward, the radial fold similarly curved, forming a furrow on upperside and ridge on underside, the hind margin with a fringe of very long hair proximally; basal patch wanting, cloudings slight, the thick submacular lines more uniform in expression, only a rather strongly curved one just outside the cell-dot notably thicker.—*Hind-wing* with termen little convex between SC^2 and tornal region and without any prominence at R^3; somewhat contorted, costal region pale above, swollen beneath, SC^2–R^1 stalked, discocellulars weak, cell-fold strong, region of submedian fold with a ridge of suberect hair; marked nearly as fore-wing or slightly more blurred.

Vunidawa: 2 January, 1932, type ♂. With it may belong 3 ♀♀, Vunidawa, 8 January, 1932, Lautoka, 1 and 18 November, 1931, which have SC^2 of hind-wing stalked (though sometimes very shortly), the tone more ochreous or less suffused than in the ♂, the postmedian the strongest marking (though somewhat more angled near costa, thence somewhat less curved), distal lines on the whole a little more slender.

As f. (? sp. div.) **mesosterea,** form n., I describe 2 ♀♀ from Vunidawa, 26 August and 3 September, 1932. Expanse 26 mm. (in *stygna* ♀♀ 26, 25 and 24 mm.); about as bright as in the brightest *stygna*; a dark spot at base of abdomen; cell-marks enlarged (elongate), on fore-wing adjoined distally by a large blackish patch which reaches costa and absorbs anterior part of postmedian, on hind-wing absorbed in a similar large spot, which, however, extends hindward instead of forward, nearly reaching abdominal margin. By size, venation, evenly expressed dentate outer lines, etc., I suspect referable here, but the first outer line is a little more excurved between R^3 and M^2.

18. **Eoasthena extranea,** sp. n.

♂, 20–21 mm. In shape and structure very near the genotype, the specialisations scarcely so strong; fore-wing with costa slightly less strongly arched, hind-wing slightly better rounded and with SC^2–R^1 about connate (the latter distinction perhaps inconstant in a larger series). Superficially very dissimilar. *Fore-wing* Naples yellow or towards straw-yellow, without suffusions except costally; the dark markings sprinkled with silvery scales, more conspicuous than the metallic scales of *gnophobathra*; basal patch less conspicuous, being spotted with the ground-colour; lines much cleaner-cut, all of the same intensity, though some are much interrupted; complete, irregularly dentate subbasal, antemedian, postmedian and proximal boundary of distal area, the latter rather thick; more or less strongly interrupted ones just proximally to the antemedian and just distally to the postmedian; a slightly interrupted submarginal and a more interrupted admarginal; enlarged spots on the outer lines at R^3 are narrowly connected so as to form a longitudinal streak to termen; termen with small vein-dots.—*Hind-wing* with bend of termen scarcely

appreciable; cell perhaps slightly less long than in the genotype; pattern in outer half as on fore-wing; proximally with only the cell-dot, one or two dots close to base, two or three small subbasal spots and a large quadrate spot about middle of abdominal margin, its distal edge forming the end of the sinuous postmedian line. Underside with the markings shadowy except in the distal area, where some are well expressed, especially the spots on R^3.—Head and body with corresponding colour distinctions from *gnophobathra*.

♀ slightly narrower-winged, ground-colour much more ochreous, markings a little weaker.

Vunidawa, ♂ type and paratype and ♀ allotype; Lautoka, 1 ♀. A further ♀ from Vunidawa, very dilapidated, is probably a much suffused aberration of the same species.

19. **Eoasthena catharia,** sp. n.

♂, 23 or 24 mm. Face with a minute tuft (or patch of raised scales) at its lower edge; red. Palpus slightly less short than in the other species; whitish, marked with red distally and on outerside. Vertex and antenna glossy white; occiput red, mixed with black. Thorax above primrose-yellow in part, with a large composite dark mark, centrally black-reddish in its anterior half, blacker in its posterior, in anterior half with also a blackish extension on either side. Abdomen with dark dorsal spots, only the first one or two and the last one or two strong. Body beneath whitish; legs whitish, the first two pairs with red line on tibia.

Fore-wing with costa still a little less arched than in *extranea*, the wing looking a trifle narrower; a very broad, tapering costal fold beneath from base to near apex; pale primrose-yellow, without irroration; a dark costal band (perhaps dark vinaceous-brown, overlaid with glossy violet-slate), about ·5 mm. in width; the other markings more violet-slate, with a slight admixture of leaden-metallic scales: a rather large oval spot on DC^2 and anterior part of DC^3; a dot in cell near base; three or four distal subcostal spots, forming triangular excrescences from the costal band; a curved row of three dots (on R^3 and M^2 and behind SM^2), indicating with the most proximal of the subcostal spots a postmedian line; termen with a spot on R^3 and two dots on median veins.—*Hind-wing* with termen strongly convex, on R^3 more toothed than in the other species; cell anteriorly shorter, DC^2 incurved as well as markedly oblique, DC^3 separately curved, an appreciable angle therefore formed at origin of R^2, SC^2 well stalked; like fore-wing but with cell-dot small, no costal streak, only one subcostal spot (on SC^2 at termen).

Underside almost unmarked, excepting the subcostal spots and the terminal spot on R^3.

Vunidawa, 1 ♂.

Subfam. Geometrinae.

20. **Cleora perstricta,** sp. n.

♂, 48 mm. Face brown in lower half, darkened with blue-blackish in upper. Palpus moderately long, predominantly blue-blackish, the first joint narrowly pale beneath; terminal joint rather elongate, somewhat clubbed, pale brownish. Antennal pectinations short (about 2), rather stout, each with a single terminal bristle. Vertex and thorax above predominantly blue-blackish, the thorax with a small, light-brown transverse crest; abdomen slender, above predominantly blue-blackish, with some brown admixture anteriorly, the projecting lateral scaling sharply contrasted, whitish; body beneath pale, the thorax strongly hairy, the patch of bristles of 3rd sternite strong, ochreous-brown. Legs rather long; hind tibia dilated, with strong pencil.

Fore-wing moderately elongate, apex not very sharp, termen crenulate, bowed, oblique, tornus rather weak; $SC^{1,2}$ very shortly stalked, SC^1 anastomosing moderately with C; fovea slight; brown, almost entirely overlaid with blue-blackish, leaving the costa irregularly pale-dotted, ill-defined brown suffusion at base and again to represent a bi-

curved antemedian line and some irregular dots or strigulae elsewhere, especially on the veins; no clear markings except a strikingly conspicuous, slender and somewhat sinuous, chamois to cinnamon-buff outer line, at approximately 4 mm. from termen, running from about R^1 to hind margin and probably further represented by a costal spot 5 or 6 mm. from apex; an irregular, deeply lunulate-dentate dark line proximal to this line, scarcely noticeable without the lens; blackish terminal dots.—*Hind-wing* with termen deeply crenate; the outer pale line and the dark zigzag one much as on fore-wing, the terminal marks somewhat more elongate; abdominal margin (with its fringe) white.

Underside mouse-grey, vaguely suffused with brown distally, with roundish dark cell-spots (smaller on hind-wing), indistinct sinuous (but not lunulate-dentate) postmedian line and faint suggestion of a pale shade beyond, dirty whitish spots at apices and behind R^3—suggestive of that of the New Zealand *Gellonia dejectaria* (Walk.) in its greyest forms.

Vunidawa, 1 October, 1932, 1 ♂.

May probably prove variable like so many of its relatives, but easily recognisable, especially with the aid of the structural characters; perhaps *sui generis*.

21. **Tolmera ochricollis**, sp. n.

♂, 46 mm. Face drab. Palpus more ochreous beneath, the sides and the long terminal joint dominantly blackish. Fillet bright ochre. Vertex dusky. (Antennae lost, except two or three proximal joints, which are not pectinated.) Patagium and pectus bright yellow ochre, almost cadmium yellow, the patagium with slightly more orange admixture. Thorax and abdomen above, as also the anal segments, dusky; black markings on end of tegula, on metathorax and on first two tergites of the long and slender abdomen, its sides and venter mostly paler, in part with an ochreous tinge, especially laterally. Hind tibia strongly dilated, with hair-pencil, the inner proximal spur materially longer than the others; tarsus little over $\frac{1}{2}$.

Wings with nearly the shape and venation of *Tolmera*, but the cells are shortened (as also in one or two New Guinea *Tolmera* of which the generic position has not been considered doubtful, e.g. *regulata*, Warr. 1907), the hind-wing more appreciably crenulate and with a noticeable abdominal flap (somewhat reminiscent of that of *Cleora repetita*, Butl. 1882, though less ample) and the fovea vestigial, covered above with a patch of black scaling.—*Fore-wing* dusky brown-grey, largely glossed with a more slaty or plumbeous colour; cell-dot black; postmedian line partly black (defined distally by a pale line), from about $\frac{3}{5}$ costa to $\frac{2}{3}$ hind margin, indented behind SC^5, then gently bicurved (outwardly at the radial area, inwardly behind); some blackish shading in basal third, bisected by a very narrow band of the ground-colour; some black spots proximal to the subterminal and (at least between SC^5 and M^1) some larger, wedge-shaped interneural ones between these and the postmedian.—*Hind-wing* less variegated; abdominal and tornal regions pale; cell-dot small; postmedian line punctuated on the veins, strongest posteriorly; an ill-defined dark shade immediately succeeding its pale defining line, a broader one about midway between this and the termen, both only developed in posterior half of wing; termen with rather large black interneural dots, that at the radial fold almost bisected thereby.

Underside almost unicolorous, with strong cell-dots; extreme costal edge of fore-wing browner and a little more varied, with pale and dark dots.

Taveuni: Qilai, at Camp in forest, 2300 ft., December 1933 (*R. W. Paine*).

The unique type has the fore-wings somewhat torn and badly rubbed, so that a perfect description is not yet possible; but it is absolutely distinct from all hitherto known species. The scheme of markings recalls the similarly shaped *Ateloptila*, but palpus and venation are very different therefrom.

NOTES ON SOME PYRGOTIDAE (DIPTERA) FROM WESTERN CHINA

By John R. Malloch.

The notes presented below are based upon material recently received by the United States National Museum from Dr. D. C. Graham, who has submitted a great amount of material from the less accessible parts of Western China, including specimens upon which were based six of the species recently described by Hendel.

It is very probable that many more species will yet be found in this faunal region which has been but imperfectly exploited for insects.

Adapsilia, Waga.

This genus is not very well defined, the usual character utilised for the purpose of separating it from its closest allies being the ridged vertical margin. This is not at all marked in some of the species, and the seven referred to the genus by Hendel in his paper on the Palaearctic Pyrgotidae (1933 *) are a rather complex assemblage. He has distinguished two subgenera, *Eupyrgota*, Coquillett, having the ocellar, orbital, and postvertical bristles lacking and the scutellum with at least six marginal bristles, and *Adapsilia* in the strict sense, having the frons with ocellar, orbital, postvertical, and at least one pair of strong vertical bristles present, and the scutellum with only four marginal bristles. I find that there is a quite marked development of the ocellar and postvertical bristles in some species that belong to *Eupyrgota*, including the genotype, *luteola*, Coquillett, and that the old character cited above of the ridged vertex is quite as reliable a guide as the other, in fact the more marked the elevation of the vertex the less development there is of the bristles on the vertex and adjacent areas. In *luteola*, *griseipennis*, Hendel, and *verrucifer*, Hendel, of the Palaearctic species and in *ypsilon*, Hendel, from Africa, there is in the female only a very marked oval or lanceolate bare area on the central part of the anterior side of the mid femur. I have already published a statement to this effect as regards *luteola*, and Hendel refers to my statement in his paper. He makes no mention of the occurrence of such a feature in his two new species described in that paper, though an examination of his types in the United States National Museum discloses the fact that they possess that character. I believe that the "rote langsrinne" which Hendel refers to as present on the mid femur in *fusca*, Hendel, is a similar structural character. I have not seen this species nor *flavopilosa*, Hendel, so cannot decide the point.

Below I present a few notes on the species before me in the hope that they may prove of value to students of this interesting family.

Adapsilia griseipennis, Hendel.

This species differs from all the others in Hendel's paper on the Palaearctic fauna in having the wings entirely hyaline, and in being much paler in colour, lacking dark thoracic markings. The bare patch on the mid femur of the female is near the centre of the anterior surface and quite broadly ovate. The parafacial in profile is about half as wide as the eye at base of antenna. The sternopleura has one moderately long bristle and some adjacent long setulae; the femora have the anteroventral and posteroventral hairs stronger apically, and one long bristly hair near base on the ventral surface.

I have seen only the type, which is from Western China.

* 1933, *in* Lindner, E. Die Fliegen palaearkt. Reg., (73), **36**: 1–15, 1 pl.

Adapsilia verrucifer, Hendel.

There are two females in the U.S. National Museum collection bearing this name label, and I consider the one mentioned first in the paragraph after the description, which is in perfect condition, to be the type. The second specimen is without the head and belongs to a different species. I deal with it below.

The type thus selected has a broad bare patch on the centre of the anterior side of the mid femur, one long sternopleural bristle, the parafacials much narrower than in *griseipennis*, and the wings marked as in *hirtoscutellaris*, Hendel. All the femora have the ventral hairs rather short, close and decumbent, and one longish fine bristle near base on ventral surface.

I strongly suspect that the two males Hendel placed with *hirtoscutellaris* are referable here as they each have a strong sternopleural bristle. It is possible of course that this may be a sexual character, but I have not found it to be so in any species which I have previously examined. I leave the point in abeyance meanwhile.

I have before me some additional specimens from the type locality.

Adapsilia brevispina, sp. n.

♀. Similar to *verrucifer* and *hirtoscutellatus* in general appearance and wing-markings, differing essentially in having the femora with very short black erect setulae or bristles on the ventral surface which are visible only with a high-power lens, the usual long one at base being at most one-third as long as the basal diameter of the femur. Mid femur without a bare patch on anterior surface.

Head testaceous-yellow, the face and genae shining, the former with a black central vitta on its entire height, widened below, the gena with a brown spot below centre of eye. Ocellar bristles very short and hair-like; orbital pair strong and divergent; postverticals a little longer than the ocellars; inner verticals long and strong, outer pair short and weak. Third antennal segment oblong, broadly rounded at apex, on outer side over 1·5 times as long as second; aristae subnude; face with the usual central linear carina which is visible on its entire extent in profile; parafacial at base of antenna not as wide as base of third antennal segment, rapidly narrowed downward, and with hairs only on upper fourth or less; face receding below; gena about as high as width of parafacial above; proboscis stout and short; palpi slightly narrower than third antennal segment, with numerous short and rather strong black bristles.

Thorax coloured as head, with dark brown mesonotal vittae that are almost fused so that the disc appears almost entirely dark; pleura with a vertical dark brown stripe over centre of mesopleura and anterior margin of the sternopleura, and a spot on pteropleura; postnotum broadly dark brown; scutellum brown centrally at base. All bristles and hairs fuscous. The following bristles present: humeral 1, notopleurals 2, supra-alar 1, postalars 2, dorsocentrals 2, sternopleural 1, pteropleural 1, mesopleural 1; scutellars 4, and numerous discal hairs. Prosternum with a few hairs.

Legs brown, hind femora and tibiae darkest, the coxae, all of fore femora and bases of mid and hind femora testaceous-yellow. All femoral bristles very short as noted in the diagnosis above.

Wings greyish-hyaline, veins brown, both cross-veins clouded with brown and three brown marks on the costa, the first over the furcation of second vein, the second directly above the inner cross-vein with which it may sometimes be fused, and the third on apex of second vein from before the spur vein to its apex which may extend as far as third vein. The spur vein well developed and distinctly beyond level of outer cross vein.

Abdomen coloured as thorax, dorsum largely black. Apices of all tergites with bristles, more marked laterally, the apex of the genital cone also bristled. The elongate second sternite with a group of about half a dozen bristles on each posterior lateral angle. No ventral protuberance on genital cone, but the specimen is slightly teneral so that it may not present normal characters.

Halteres yellow.

Length, 7·5 mm.

Type, China: Shin Kai Si, Mt. Omei, Szechuan, 4400 ft. (*D. C. Graham*). U.S. Nat. Mus.

It appears probable that the headless female identified as *verrucifer* by Hendel belongs to this species as it agrees in general coloration and structure with the type, but it lacks the sternopleural bristle. I incline to accept it as a paratype, but the lack of the head prevents a check upon the important antennal characters so that one cannot be absolutely certain. The locality is the same.

Adapsilia megophthalma, sp. n.

♀. A darker species than the preceding one, with the legs fuscous except the coxae, trochanters, extreme bases of femora and the knees which are pale testaceous. The wings are marked with fuscous as in *breviseta*, but there is no spur vein on the posterior side of the second vein and the dark apical mark extends backward to level of the outer cross-vein. No bare patch on mid femur.

General colour of *head* darker than in the preceding species, but the dark central stripe on the face less developed. Frons wider and shorter, with the surface hairs stronger, the ocellar bristles long and strong, and two instead of one pair of orbitals. Facets of the eye on anterior part below level of antennae much enlarged (not appreciably enlarged in *breviseta*); third antennal segment narrowed slightly apically instead of widened, and hardly longer on outer side than second; aristae bare; palpi spatulate, wider than third antennal segment, black bristled.

Thorax shining fuscous on dorsum, with a vertical black stripe on the yellow pleura as in *breviseta*, the bristling and hairing similar but stronger.

All *femora* with distinct ventral bristles, the posteroventral series on fore pair complete, on other pairs on basal half or less, the one nearest base longest, most of them distinctly longer than the femoral diameter.

Wings broader than in *breviseta*, the spur vein lacking.

Abdomen shining black above, more strongly bristled than in *breviseta*, the genital cone rather strongly bristled on most of its length above.

Halteres yellow.

Length, 7·5 mm.

Type, China: Chengtu, Szechuan, 1700 ft. (*D. C. Graham*). U.S. Nat. Mus.

Another character that may prove of value in distinguishing these species is to be found in the nature of the armature of the hind trochanters. In *breviseta* this consists of very short but strong black spinules, while in the others there are numerous longer and finer hairs present on the underside. It may be pertinent to note here also that in the males I have examined there are two ventral abdominal segments which have on each side a strip of closely placed black bristly hairs resembling brushes which stand erect along each edge.

NEW SPECIES AND RACES OF JAVANESE ODONATA

By M. A. Lieftinck.

(*Buitenzorg Museum.*)

The present descriptions of new forms of Javanese Odonata are the last to be published before giving a general account of the fauna, which will appear shortly under the title "An Annotated list of the Dragonflies (Odonata) of Java."

Gynacantha stenoptera, sp. n. (fig. 1).

Material examined.—One ♂ (adult), with an old locality-label: Auctie v[an] Eyndh. [oven], Java, in H. Albarda's handwriting. Holotype in Museum Leiden.

Closely related to *G. subinterrupta* (Ramb.).

Fig. 1.—*Gynacantha stenoptera*, sp. n. ♂. Java. Anal appendages, oblique dorsal view.

♂.—Colours somewhat faded. Head shaped and tinted as in *subinterrupta*. Labium pale ochreous, with a greenish tinge; clypeus and frons pale olive-green, sides rather more yellowish. On the horizontal part of frons a brownish T-shaped mark, the vertical limb of the T a little narrowed anteriorly, broader and not so sharply delimited as in *subinterrupta*. *Thorax* discoloured, dull brownish-olive (apparently green in life), entirely unmarked, dorsum with traces of incomplete light bands on either side of the carina. Sides growing paler beneath. Venter light brown. All inter-alar spaces grass-green. *Legs* pale reddish-brown, unicolorous. *Wings* entirely hyaline; hinder pair with merest traces of yellow in extreme basal edge of *cu*. Pterostigma a little longer than in *subinterrupta*, pale brownish-yellow. Shape of wings decidedly characteristic. The posterior margin of both front and hinder pair noticeably straighter in basal part than in the said species. The basal third of front wing is conspicuously narrowed so as to include a single row of 4–5 cells between the proximal portion of Cu_2 and the anal margin, which itself is not evenly convex, as in *subinterrupta*, but bears a slight concavity at the level of vein Cu_2. In the hind-wing, the posterior margin of which in *subinterrupta* is still more convexly bent at base than in front-wing, the anal angle is perfectly straight in the new species, and the margin, up to a level beyond end of anal loop, is also straight, or even a little concave. Distal portion of all wings narrower, and tips more pointed. The peculiar basal narrowing of the wings gives them a strikingly "stalked" appearance not found in any other species of the group. Neuration more open than in *subinterrupta*. Nodal index $\frac{21.28.27.22}{21.21.21.21}$. Anal area of front-wing with two rows of cells, the upper row consisting of almost squarish cells. Not more than 10 rows of cells, each with a maximum of 4 cells, between Cu_2 and hind margin in front-wing, and not over 13 rows with a maximum of 6 cells between veins in hind-wing. Space between M_4-*Mspl* only 3 cells wide in front-wing, 4 in hind-wing; space between

Rs-Rspl only 4–5 cells wide in front-wing, 4 in hind-wing. Basal half of the space enclosed by Rs_a and Rs_b with two rows of cells only. Between distal side of anal triangle (A_3) and the anal loop only two rows of cells, none of these being divided. Anal triangle 3-celled, identical in shape to *subinterrupta*. *Abdomen* shaped much as in that species; basal segments enormously widened; constriction of segm. 3 similar at base to *subinterrupta*, but the distal portion of this segment more evenly widened to behind. Auricles about 1½ times larger than in *subinterrupta*, still more projecting laterally and with a row of 11–12 minute denticles along margin. Colours much faded, apparently quite similar in arrangement to the other species, segm. 1–3 distinctly spotted with blue. Segm. 4–10 narrow and of equal width throughout; markings indistinct. *Anal appendages* markedly different from *subinterrupta* in that the inferior one reaches half the length of superiors; dark reddish-brown, shaped as in fig. 1.

Length: abd. + app. 52, hind-wing 46·5, pt. $\frac{3{\cdot}4}{3{\cdot}2}$ mm.

♀ unknown.

In the six years that have elapsed since the above description of the unique specimen was prepared, I have not received nor taken myself any more material of this quite distinct species. It is apparently a very rare insect. Although obviously coming nearest to *subinterrupta*, it differs considerably from it by the curious shape of the wings and by the strikingly different form of the anal appendages.

Megalogomphus junghuhni, sp. n. (fig. 2).

Material examined.—One ♀ (adult), labelled: Java, Heyne; "*Heterogomphus* près *cochinchinensis* Selys, ♀" in de Selys's handwriting. Holotype in the Brussels Museum.

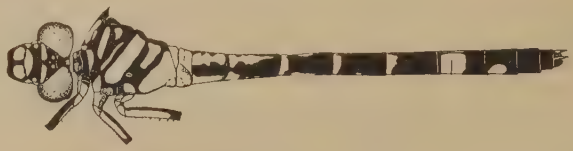

Fig. 2.—*Megalogomphus junghuhni*, sp. n. ♀. Java. Colour-pattern diagram, oblique side view.

♀.—*Head* very large, anterior portion strongly protruding, frons and clypeus much inflated, labrum strongly convex in profile view. Black, spotted with bright yellow, as follows: Labium yellow, tips of the lobes margined with black; pile golden-brown. Mandibles, with the exception of a thick black stripe joining the upper lip (including the tips) ochreous. Genae with an adjacent spot of the same colour. Labrum black with two large roundish spots, one on each side of the middle; these spots touch the base but are separated by black for a distance less than half the diameter of each spot, the distal margin of the labrum being still more broadly black; margin fringed with golden-brown hair. Anteclypeus yellow; postclypeus, save for a small circular spot close to the eye-margin, black. Frons black, the horizontal division with two large transverse bars which are distinctly separated by black at middle. Remainder of head and occiput deep black. Occipital ridge with indistinct yellowish median spot, its hinder border straight, furnished on each side with a small, tooth-like tubercle, close to the eye-margin. *Prothorax* black with a yellow side-spot and a smaller median spot in front of the posterior lobe. *Synthorax* black; mesothoracic collar (narrowly interrupted mesally), a spot upon middle of the dorsal carina, two broad, isolated, straight antehumeral stripes over the middle of each episternite, and a

likewise isolated circular spot placed about the upper edge, just in front of the antealar triangles, bright yellow. There is, besides, a narrow yellow stripe running over the lower two-thirds of the humeral suture, which, after a short interruption, passes broadly over to fill up most of the infraepisternites. Posterior ¾ of mesepimerum, except below, and nearly the whole of metepimerum, bright yellow; a much smaller yellow marking, widest above, is placed upon the upper half of each metepisternite, the metinfraepisternal area being also yellow in colour. Ventral surfaces largely yellow; sutures black. *Legs* robust; black. Inner sides of femora partly yellow; knees with a yellow point (fig. 2). *Wings* hyaline; bases, up to the level of *Arc* very faintly tinged with yellow. Neuration almost identical with Williamson's photograph of a male *M. cochinchinensis* from Tonkin. Anal loop shaped as in that figure; only two cross-veins between M_{1-3} and M_4 in front-wing, one in hind-wing. *Arc* at the second antenodal. Anal field of front-wing beginning with 2 × 1 cells, thence with two rows of cells. Costal nerve finely yellow in front. First and seventh antenodal thickened. Pterostigma brownish-black, not braced. Nodal index $\frac{12.15.16.11}{13.13.12.11}$.

Membranula vestigial, greyish in colour. *Abdomen* for the greater part black, segments marked with bright yellow as is shown in the figure. The basal rings of segm. 4–5 are not interrupted by black dorsally, but on 6 and 7 each is divided by a fine black dorsal line. Dorsum of 8 with traces of two basal points and with a much larger, squarish spot covering the basal half of the sides. Segm. 9–10 and apps. black. Sternites black. Vulvar scale small, deeply cleft by a wide U-shaped incision, forming two narrowly triangular, pointed lobes, which are directed straight backwards. Appendages equal in length to segm. 10, narrow and acutely pointed.

Length: abd. + app. 56, hind-wing 55, pt. 6·5 mm.

This big, handsomely coloured insect appears most closely related to a group of other large-sized species ranging from India to China. The presence of a yellow humeral stripe and a third intercalated fascia covering part of the metepisternite, places it nearest to *M. sommeri* (Selys), from China, a species with which I have no personal acquaintance. *M. junghuhni* might be distinguished from *smithi* (Selys), *hannyngtoni*, Fraser, *cochinchinensis* (Selys), etc., by characters which are best understood from the accompanying colour-pattern diagram. *M. icterops* (Martin) and *M. sumatranus* (Krüger), the only species inhabiting Malaysia, are abundantly distinguished by their much smaller size and quite different arrangement of pale markings. I have named this species after F. Junghuhn, the famous explorer of his "Java," who died in 1864.

Orthetrum silvarum, sp. n. (fig. 3).

Material examined.—16 ♂♂ (all adult), West Java: Mt. Pangrango-Gedeh, Tjisaroea Est., 1200 m. alt., June 5 and 9, July 16, 1932 (*M. A. Lieftinck*). Type in the Buitenzorg Museum, paratypes in the British Museum and other collections.

Species of moderate size.

♂.—Labium greenish-yellow, the median lobe rather more brownish; genae and mandible-bases olivaceous. Labrum bright ochreous, its margin indefinitely reddish-brown. Clypeus and frons throughout dull olive-green, this colour more vividly pronounced when traced upwards. The flattened triangular fields in front of frons well marked off and bordered laterally and ventrally by a fine ridge, the fields thus enclosed being deep black in colour. Vertex and occipital triangle black, or almost so, the latter shining, with two indistinct pale spots behind. Pile ashy-brown. Occiput dark brown; on each side along the eye-margin is placed a squarish yellow spot, followed below by an elongate marking of the same colour. *Prothorax* black, the anterior lobe, a strongly waved line upon the

middle portion, and the entire posterior lobe, olive-green. Sides sparsely powdered with blue. Ground-colour of synthorax a deep velvet reddish-black; dorsum with two sharply defined, almost straight, clear green antehumeral bands which are widest above, touching the antealar triangles and diverging a little to below, the tips of each being obtusely pointed. These stripes vary somewhat in width, the black interspace about half-way their length being of equal width to almost twice broader than each of the adjoining bands. Antealar triangles black, each with a green oval spot upon middle. Thoracic sides with two quite sharply delimited freshly grass-green bands, the anterior one covering nearly the whole of the mesepimerum, and the posterior one occupying the entire metepimerum. Interspaces dark brownish-black with a low bronzy gloom. Venter of thorax dark greyish-brown, sutures faintly bluish-pruinose. Wing-bases also powdered with blue above. Coxae dark brown, very slightly pruinose. Legs otherwise black, save for a brownish streak along inner sides of anterior femora. Spines on posterior femora numerous but excessively short (very

Fig. 3.—*Orthetrum silvarum*, sp. n. ♂. Java. Accessory genitalia of 2nd segment, left side view.

similar to *O. luzonicum*, Brauer). *Wings* clear; all nervures black. Membrane very slightly tinged with brownish in old specimens; tips smoky. Pterostigma dark sepia-brown, almost black. Membranula greyish-black. Extreme bases of hind-wings with a golden-yellow spot (occasionally also perceivable at base of front-wing). *Arc* coalescent with Ax_2, or placed slightly beyond it. Cu_1 and Cu_2 in hind-wing arising from the lower angle of triangle. Cu_1 in front-wing strongly curved but less markedly so than in *O. luzonicum*. Discoidal field of front-wing, as far out as the proximal edge of the bridge-space, containing only two rows of cells, further on with three and more rows. All triangles with a single cross-vein. Invariably one row of cells between *Rs* and *Rspl*. Antenodals $\frac{13–15}{10–12}$, postnodals $\frac{10–12}{10–12}$. Neuration otherwise as for typical *Orthetrum*. *Abdomen* narrow and slender, slightly spindle-shaped, segm. 2–3 but little broader than the greatest width

attained at end of segm. 6, the strongest constriction lying at the base of segm. 4. Terminal segments very evenly narrowed to behind. Pruinosity absent. Coloration changing from dark brown on first two segments to deep black on the remainder of abdomen. Pattern sharply pronounced, greenish-ochreous to olive-green, as follows:—sides and a roundish spot on the back of 1; two large spots, confluent behind, upon the sides and a large isolated cordiform green patch on mid-dorsum of 2. Segm. 3 and 4 with a longitudinal dorsal marking, occupying the basal $\frac{4}{5}$ of the segment; this spot is longitudinally divided in two equal portions by the black mid-dorsal carina, each of the halves being again traversed in its basal third by a black line over the transverse carina. On segm. 5, 6 and 7 the dorsal markings are sub-equal in length but are not split up transversely. The tergites of segm. 8–10 usually are wholly black, although occasionally 8 has also traces of a paired spot at base. Ventral surfaces of tergites 4–7 with a pale brown spot, the sides and under surfaces of 3 acquiring a uniform dull greenish tint, interrupted only by a fine black line over the lateral carina. Sternal plates and sides of segm. 1–3 thinly pruinose blue. Genitalia of segm. 2 brownish-black. Lobus anterior depressed, basal surface in side-view finely denticulate; narrowed behind, distal portion tongue-shaped, apex scarcely notched. Hamule distinctly higher than lobus anterior, shaped as in fig. 3, its outer lobe completely rounded. Genital lobe well developed, not projecting beyond hamule; pile black. *Anal appendages* black, shaped much as in *O. luzonicum*; superiors with sub-apical ventral projection well rounded, and with tips sharply pointed.

Length: abd. + app. 29–31, hind-wing 34–36, pt. 3 mm.

♀ unknown.

Easily differentiated from other members by the absence of any pruinescence of the body, by the sharply contrasting, richly green-and-black colour-pattern of thorax and abdomen, by the black patch in front of head, and by the spindle-shaped abdomen. Most nearly related to *O. luzonicum*, Brauer, from which it is rapidly distinguished by all above-mentioned characters, to which the larger size, the dark pterostigma and the quite different shape of the genital hamule should be added.

Quite unlike other members of the genus, *O. silvarum* is a shade-loving species, occurring in dense primeval forest. It was discovered incidentally on exploring a forest-pool in search of Aeschnid larvae. The males were seen hovering very near the ground in sunlit-openings at some distance from the pool. When disturbed they flew away, and settled on the foliage of surrounding trees, often far beyond the reach of an insect-net. I observed solitary individuals basking in bright sunshine with outspread wings and remaining motionless for a long time. Most of them, however, were caught by beating. The flight is swift, though most of the time is spent among the leaves. Owing to their cryptic colouring and the peculiar habit of resting on leaves, it is a remarkably inconspicuous insect.

Neurothemis intermedia excelsa, subsp. n.

Material examined.—One ♂ (juv.), Mid Java: S. Banjoemas, Patimoean, sea-level, April 19, 1929 (*F. C. Drescher*); one ♂ (ad.), East Java: Rembang, Kedangan, 40 m. alt., Dec. 2, 1927 (*Th. Verbeek*). Both specimens are in the Buitenzorg Museum collection.

♂ (Kedangan, type).—Small. Mouth-parts bright orange. Clypeus, frons and vertex deep orange-red. Thorax similarly coloured, deepest on the back; sides and under surfaces a little paler and slightly intermingled with green. *Legs* dirty orangish; posterior third of fore femora with indistinct brownish streak interiorly. Inter-alar spaces and abdomen deep orange-red. A diffuse brownish stripe along sides of segm. 1–9, not touching base or apex

of segment, indistinct and interrupted by the transverse carinae along basal segments. Genitalia and appendages not different from typical *intermedia*. *Wings* distinctly narrower and more rounded apically than in the typical race, very similar in outline to *N. nesaea*, Ris, from Celebes. Hyaline, except at base. Neuration red, in front-wing to a level slightly beyond nodus and to distal side of triangle, in hind-wing to distal angle of bridge and outer side of anal loop; otherwise dark brown. The basal colouring of the wings is best described as " mars yellow " (Ridgway). In front wing this tint spreads out as far as Ax_2 to slightly over *Arc* and one cell proximal to *ti*, some of the cell middles being a little paler. In hind-wing the colour is sharply delimited, extending outwards to half-way between base and nodus; from here the convex outer margin crosses the distal angle of *t*, the most distal cross-veins in the loop, and then curves sharply backwards towards the anal angle, the anal border being hyaline for about 1½ to 2 cells' breadth. The median space and most of the cell middles along border are paler in colour. Triangles once crossed; *ti* 3-celled. Discoidal field of front-wing, to a level far beyond distal angle of bridge, with 3 rows of cells only. *Cux* $\frac{4.3}{2.2}$. Pterostigma ochreous. Nodal index $\frac{8.10\frac{1}{2}.10\frac{1}{2}.7}{9.10.\ \ 9.\ 8}$.

♂ (Patimoean, juv.).—Identical with the preceding specimen but somewhat smaller and all colours paler. A brownish band on each side of the dorsal carina on the back of thorax. Dark stripe along abdominal segments a little wider, better pronounced, black behind. Basal spots of wings equally large but amber-coloured instead of mars yellow; sharply defined distally. Neuration identical; nodal index $\frac{9.10\frac{1}{2}.10\frac{1}{2}.9}{8.\ 9.\ \ 8.\ 9}$.

Size small. Abd. 21·5, hind-wing 24, pt. $\frac{3}{3.2}$ (type); —, 22, $\frac{2{\cdot}6}{2{\cdot}8}$ mm.

Differs from typical *intermedia* (Ramb.), of which I have seen specimens from India and Ceylon, by its narrower and less densely reticulated wings, by the pterostigma being shorter and by the much less extensive and quite differently coloured basal wing-marking. *N. i. excelsa* differs further by the narrow discoidal field and the great reduction of intercalated sectors. The obtusely rounded and narrow wings point to real affinities with *nesaea*, Ris, from which I have examined a few specimens from S. Celebes, but in this species the neuration is much closer and the basal colouring of the wings is entirely different. From *N. i. atalanta*, Ris (Assam), this subspecies differs by its greater size, the colouring of the wing-bases being less extensive and of a much darker tint. The eastern *nesaea* might well be regarded as a participant of the " formenkreis " *intermedia*. I cannot judge whether *N. i. degener*, Selys, from Further India, should be placed in the same group.

A NEW SPECIES OF COCCIDAE (HEM.) FROM KENYA

By H. C. James, B.Sc., Ph.D., F.R.E.S.

(*Zoological Laboratory, Cambridge.*)

Eriococcus kijabensis, sp. n.

The test of the adult female a white, slightly spiny, ovoid sac, completely enclosing the insect except at a small caudal opening. The insect itself is oval in outline, dark red in colour, and covered dorsally with long glassy spines. *Antennae* seven-jointed, occasionally eight-jointed owing to division of the fourth segment; the segments arranged in the following proportions (1) 10, (2) 10, (3) 15, (4) 17, (5) 7, (6) 7, (7) 12; setae absent on third segment. *Eyes* present; rostrum dimerous, the segments subequal in length. Legs

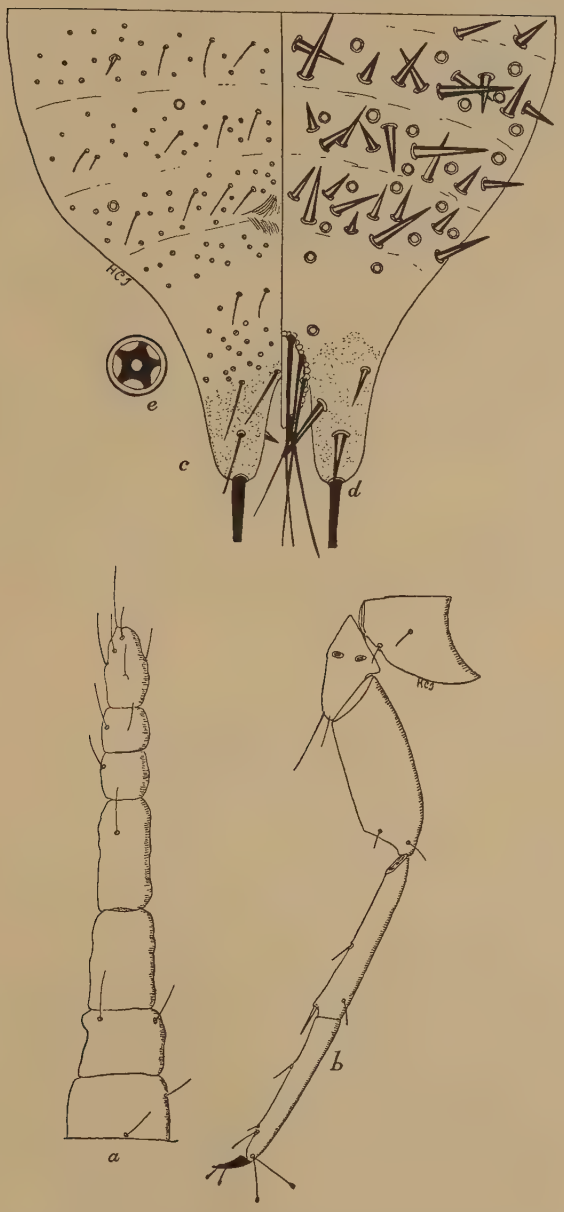

FIG. 1.—*Eriococcus kijabensis*, sp. n.

a, antenna × 310; *b*, leg × 170; *c*, posterior segments of abdomen. Venter × 183; *d*, posterior segments of abdomen. Dorsum × 183; *e*, quinquelocular pore × 540.

long and slender; tibia and tarsus subequal; claws each with a small sub-apical denticle; both pairs of digitules knobbed; those of tarsals the larger; tarsals setiform; unguals filiform; no translucent pores on hind coxae. *Body spines* numerous but almost confined to dorsum; sharp pointed, of unequal size and arranged segmentally in bands; spines absent along the intersegmental lines. A number of large circular pores present on dorsum; this type of pore is replaced on the venter by a larger number of small quinquelocular pores which are particularly numerous in the posterior abdominal region, setae absent on dorsum; present in transverse segmentary arrangement on venter. Anal lobes well developed and chitinised; anal lobe setae more than twice the length of anal ring setae.

Length of body varies from 1·30 mm. to 2·50 mm.; breadth from 0·75 mm. to 1·42 mm.

Type host :—Leaves of *Hypoestes verticellaris*, L. (Acanthaceae).
Type locality :—Kenya : Kijabe.

Phenacoccus insolitus, Green.

This species was collected by the writer from leaves and stems of *Sida rhombifolia*, L., on the shore of Lake Naivasha, Kenya Colony, where it was common. The appearance of the insects in life corresponded with the original description.

Antonina indica, Green.

This species was collected from the roots and rhizomes of *Pennisetum clandestinum*, Hochst, and *Digitaria abyssinica*, Stapf, and other grasses at Gura River Bridge, Fort Hall Rd., Nyeri, Kenya, at Sagana Railway Station, Kenya, and at Muhoroni, Nyanza Province, Kenya.

NEW MOSQUITOS (DIPT.) FROM THE NETHERLANDS INDIES

By J. Bonne-Wepster.

(*Institute for Tropical Hygiene, Royal Colonial Institute, Amsterdam.*)

Armigeres (*Leicesteria*) *annulipalpis* (Theobald).

A mosquito of moderate size with palpi and legs banded and a well marked abdomen. Only the female has been described hitherto.

♂. *Head.* Occiput clothed with flat dark scales with bluish shine, a rather broad median area of creamy flat scales present. On the nape a few very small upright forked scales with golden reflection. Down the sides a patch of flat, small white scales followed by a patch of dark scales like those on the occiput. Strong dark brown orbital bristles, and four much weaker, long, light golden ones between the eyes. A tuft of creamy-white ligulate scales below these bristles. Eye-margins light. Proboscis dark, with metallic reflection, rather short and thick, curved. Palpi longer than proboscis, slender, upturned, marked with white bands and spots as follows : a rather broad band on the middle and a narrower one at the base of long joint, a moderate white spot at base of penultimate and a much larger one at base of apical joint beneath; no hair tuft present. Clypeus light brown with two conspicuous rows of rather long narrow creamy-white scales. Antennae with shaft and hairs light brown, the latter in certain lights either much lighter or much darker, implantations

of hairs a little darker. Tori densely clothed on inner and lower surface with small, flat white scales. *Thorax* rather narrow. Mesonotum covered with rather long, narrow curved golden scales, these scales much shorter and broader over roots of wings. A bunch of long, narrow curved white scales medianly in front; a broad white scaled margin in front and a narrow one at the sides towards roots of wings of broader, straight, nearly flat scales. Scutellum with broad rather large flat golden scales, golden bristles present. Pronotal lobes clothed with rather narrow, appressed white scales laterally and in front, remaining part with a patch of dark scales, golden bristles present. Pleurae: large dense patches of white, broad flat scales present nearly all over the pleurae; on the posterior pronotal lobe the scales are creamy and less flat and on the post spiracular area they are quite dark, nearly black except one or two close to the spiracle which are golden in certain lights. *Wings* dark-scaled, outstanding scales long and narrow on third vein, rather large and broad on subcosta and basal three-fifths of L.I, remaining scales shorter and broader than those on third vein. *Legs* dark with distinct light banding and spots. All femora with a large white

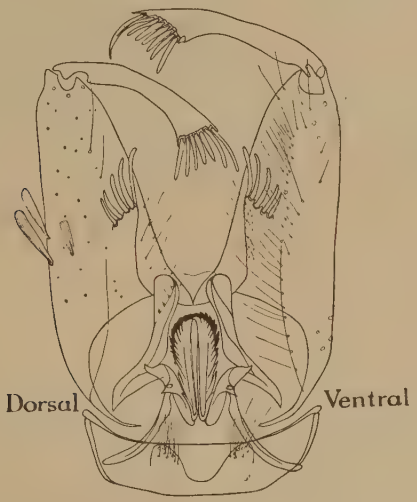

Fig. 1.—*Armigeres* (*Leicesteria*) *annulipalpis*, hypopygium.

area on under surface and a distinct white knee spot; on front femora the white on under surface nearly to tip, on mid femora the white is less extensive, on hind legs more than basal three-fourths are white. Tibiae with an incomplete white ring at base, front tibiae very light towards apex on underside. Fore and mid legs with white rings on tarsal joints I and II, joint III with a basal white spot. All tarsal joints of hind legs with distinct basal white rings. *Abdomen*: S. I black dorsally, laterally a large white spot from base to apex, ventrally all white; S. II dorsally with a median basal white spot, laterally a longitudinal white line beginning at base, running till near apex, and then curving towards dorsum, medianly not reaching the line from the other side, ventrally white from base to apex; S. III like S. II, except that there is no dorsal basal median white patch, the lateral white stripe is extremely broad basally and narrows abruptly, the white on the venter is only on the basal half; S. IV, V, VI as III, but the lateral stripe is not so broad basally nor is the venter so broadly white, the lateral stripe forks about the middle of S. IV and subapically

on S. V; on the segments IV, V and VI the subapical, white, interrupted dorsal band is narrower. On S. VII not much is to be seen of an interrupted subapical band, on the other hand many yellowish scattered scales all over the segment dorsally, venter of S. VII as in S. VI, S. VIII all dark above and laterally, yellowish and white scales intermingled with dark ones all over venter. S. IX dark. Very few yellowish scales laterally basally on S. IV, V and VI in type specimen. In other specimens these scales are more numerous. There are females of this species in the collection in the Institute from the same breeding-place as the males just mentioned, some of them *with* these yellowish scales and others entirely *without*.

Hypopygium (fig. 1). Coxite rather long, about three times as long as wide, a slender basal lobe present, with five long spine-like appendages, decreasing in length laterally; scales and most of the long dorsal hairs missing, ventrally hairs present shorter. Style moderately long, narrowed about the middle, tip broadened and straight with a comb of 6, 7 or 8 teeth, the number varying even in the two styles of one specimen. Paraprocts weak with rounded tips and 4 small hairs on one side. Phallosome slender with coarse teeth all around the margin. Lobes of the ninth tergite rounded with 9 or 10 moderate hairs.

NETHERLANDS INDIES: Buton and Ceram, February 1932.

One ♀ specimen from Buton and 4 ♂♂ and 3 ♀♀ from Ceram. The first one collected by the Military Medical Officer of the island on the bank of a small river, attacking human beings. Those from Ceram collected by Brug and de Rook, bred from water in bamboos.

Culex (Culiciomyia) javanensis, sp. n.

A plain light brown mosquito with unbanded tarsi, abdomen, palpi and proboscis.

♀. *Head.* Occiput clothed with small, narrow curved golden scales and numerous black, upright forked scales. Laterally and down the sides flat broadly ovate greyish white scales. Along the eyes a narrow margin of small flat golden scales and sparse, dark brown bristles. On the nape the narrow curved scales are greyish white in certain lights. Proboscis dark brown throughout. Palpi about one-fifth the length of the proboscis, dark brown. Clypeus greyish. Antennae brown, long hairs brown with golden shine, short hairs very light. *Thorax.* Mesonotum uniformly clothed with small, narrow curved dull-golden scales, longitudinal rows of dark brown moderate hairs present, over roots of wings, rather numerous brown bristles. Scutellum: Midlobe clothed with hair-like dark and golden scales and eight moderate bristles on hind margin, lateral lobes each with six bristles. Pronotal lobes with brown bristles, golden in certain lights. Pleurae: Two rather dark grey stripes present on the light yellowish pleurae, the upper one broad, covering posterior pronotal lobe, post-spiracular area and tip of sternopleura, the lower one narrower, crossing the lower mesepimeron, the sternopleura and the part of the pleura below the post-spiracular area. Five post pronotal hairs present, pre-alar hairs about seven, upper sternopleural five, lower sternopleural two, lower mesepimeral one. *Wings* (fig. 2). Outstanding scales linear, slightly broader towards apices of fork cells. Base of posterior fork cell nearer to base of wing than that of anterior fork cell. *Legs.* Dark brown with metallic dark blue shine in certain lights, under surface of femora creamy-yellow throughout. *Abdomen*: Dorsum all dark brown with dark blue metallic shine, venter creamy-yellow. Golden hairs on apices of segments dorsally and all over venter.

♂. Palpi exceeding the proboscis in length by a little more than last joint, numerous long hairs on last two joints, typical *Culiciomyia* scales present on long joint. Antennae

light brown with all but the last two joints very short, implantations of hairs dark brown, long hairs on all but the last two joints, these hairs brown, golden in certain lights, on last two joints short greyish hairs only. Golden hairs on *abdomen* more numerous than in the female. Hypopygium (fig. 3): Coxite moderate with a finely setose para-apical, rounded lobe. One long flattened filament on this lobe and three still longer ones on the apical lobe near to it, also two flattened spines much shorter than the filaments. No scales on coxite.

FIGS. 2–3.—*Culex* (*Culiciomyia*) *javanensis*, sp. n., 2, wing; 3, hypopygium, all dorsal and most of the ventral hairs omitted on coxites.

Style crested before tip and with a flattened subapical small appendage, three fine hairs near crest. Paraprocts rather broad and short, tips with a dense tuft of hairs and a comb of blunt spines, some small hairs laterally before this comb, basal arm small. Phallosome broad at base, narrow at apical three-fourths, a row of conspicuous hooks present medianly on this narrowed part. Lobes of ninth tergites rounded, setose, hairs rather long and fine.

Larvae of this species were found in JAVA: Tjisarua (near Buitenzorg), in a temporary ground pool on a mountain road (1200 m.), April, 1931. The collected larvae all pupated in the jar before they were isolated, so that no series of larval and pupal skins or corresponding imagines could be preserved. No differences were found in the cast skins, and the males and females obtained are considered to be one species. No larval skins are available for description. This species comes very close to *Culex bahri* and *Culex fragilis*, but can be distinguished at once by the well-defined dark areas on the pleura. As one of the females (n. 8136 collection of the Institute) is more perfect than any of the males, I have selected it as the type. Although it is not usually advisable to make a female the type of a new species, this small *Culiciomyia* is not difficult to distinguish even in the female. The stripes on the pleurae are dark grey whereas in *C. pallidothorax* there is a *brown* stripe across the upper part of the pleurae and a brown patch in the middle of the sternopleurae.—Type, allotype and paratypes in the British Museum.

Uranotaenia quinquemaculata, sp. n.

A small *Uranotaenia* with light yellowish thorax and dark abdomen, five conspicuous dark brown (almost black) spots on the integument of the mesonotum.

♀. *Head.* Occiput clothed with broad, slate-coloured flat scales with a faint bluish shine. Sparse dark brown bristles along margins of eyes, two long bristles of the same colour projecting between the eyes. Proboscis dark brown, nearly black at tip, all the scales with pale shine in certain lights. Palpi very short, twice as long as the clypeus,

4.

Fig. 4.—*Uranotaenia quinquemaculata,* sp. n., mesonotum.

dark scaled like the proboscis. Clypeus brown with greyish lustre. Antennae dark brown, long hairs light brown, short hairs grey nearly white. *Thorax.* Integument of mesonotum (fig. 4) yellowish-brown with five conspicuous dark brown, almost black spots situated as follows: one pair over roots of wings, one pair laterally on frontal third, and one spot medianly behind, enclosing prescutellar space. A pair of submedian lines (in certain lights orange-coloured) running from front margin towards the dark prescutellar spot. Dark long and strong bristles present all over mesonotum, a median line of much weaker bristles which are greyish in certain lights. Scales only on the dark spots or quite close to these spots, and on median line. All scales very narrow, black, showing a faint slate colour in certain lights. Scutellum: yellowish-brown; on mid lobe greyish flat scales visible, all lobes with one or two (scutellum not perfect) dark brown bristles. Anterior pronotal lobes very light, with three dark brown bristles, no scales. Pleurae very light, bristles rather short, dark; one propleural bristle, one posterior pronotal, one spiracular, one pre-alar (on one side only), five upper-sternopleural, and one lower mesepimeral are present; on upper sternopleura four or five small, flat, whitish scales. *Wings.* Outstanding scales long, lanceolate, these scales and scales of fringe transparent; anterior fork cell about three-fifths the length of its stem, posterior fork cell as long as anterior, its base nearer the wing-base than that of anterior fork cell. *Legs* dark brown, upperside of femora, tibiae and about one and a half tarsal joints, with dark bluish shine, underside and about apical three and a half tarsal joints with lighter brown shine in certain lights. *Abdomen,* except S. I, strongly laterally compressed, dark with dark blue and green shine.

A single pupa found in a rot hole of a fallen tree, together with a larva of *Ficalbia fusca.* Hardly any water was present in the hole.

Java: Tjisarua (Buitenzorg), altitude 1400 m., April, 1932.

Number of type specimen 9027 of the collection in the Institute; this specimen has been presented to the British Museum.

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ERRATA

p. 119, line 3, for "Noctuid" read "Geometrid."
p. 159, line 14 from bottom, for "*prater*" read "*frater*."
p. 228, footnote, for "**1919**" read "**1918.**"

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